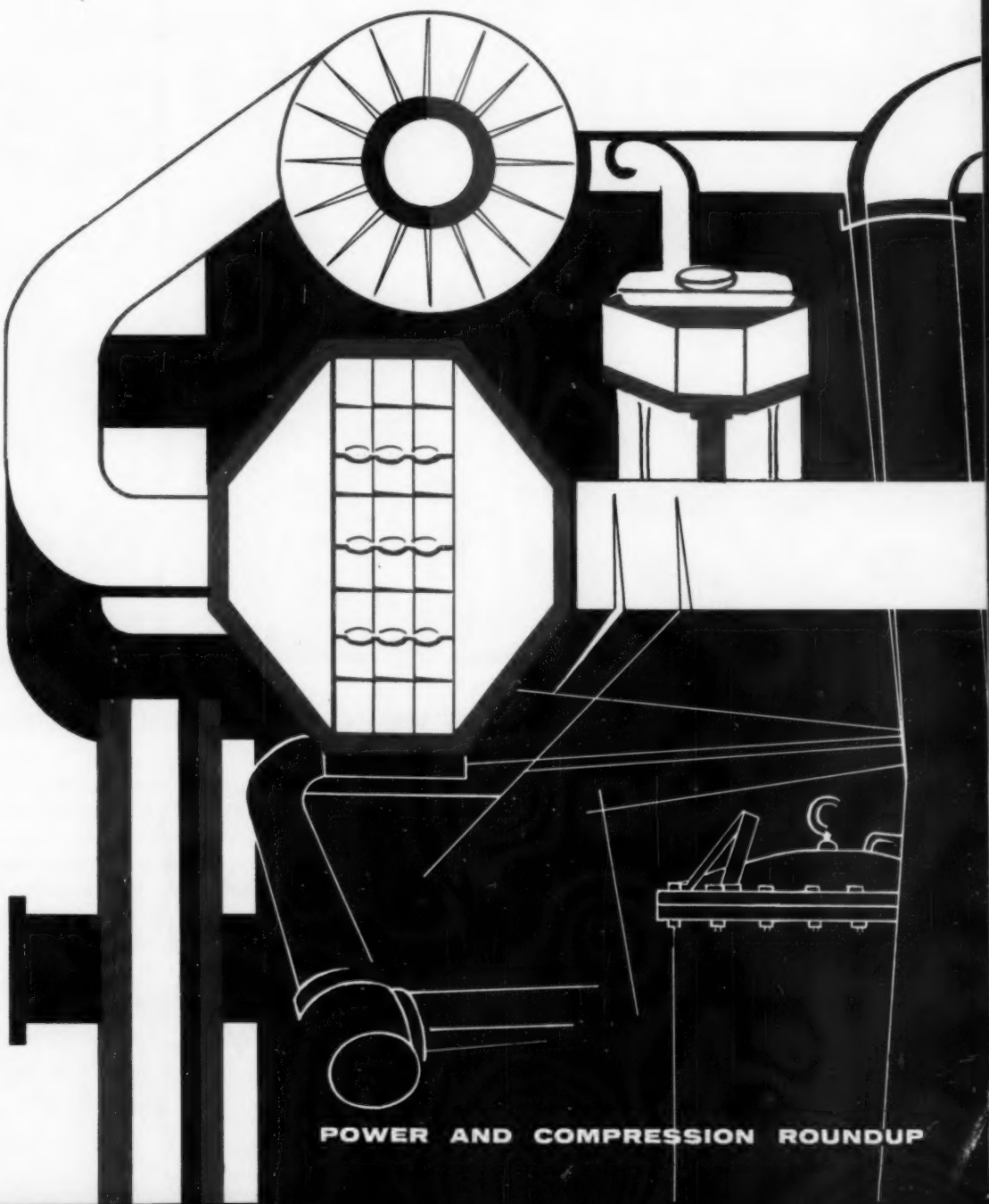
diesel power

June 1961

oem es

geared to the original equipment manufacturers
and equipment superintendents in the field



POWER AND COMPRESSION ROUNDUP

Left to right: Benjamin Groebner, Chief Engineer of Sleepy Eye power plant; George Stinedurf, Service Engineer, Cooper-Bessemer; Clair Howell, Howell Bros.

Sleepy Eye is wide awake to proved economies

Sleepy Eye is a town in Minnesota that is anything but sleepy. They bought a Cooper-Bessemer LS-8 supercharged engine . . . 2120 hp for 1500 kw service. Proved by millions of operating hours, rugged LS engines have an outstanding record for reliable, low-cost performance.

Thus, engineers of Sleepy Eye *knew* what they were getting when they decided on this proved power unit to meet the growing needs of their utility.

This Cooper-Bessemer gas-diesel engine is equipped with Turbocooler to increase its efficiency.

Call our nearest office for help in planning your power or compression facilities.

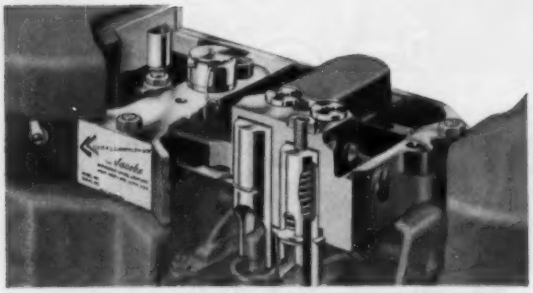
Cooper Bessemer

GENERAL OFFICES: MOUNT VERNON, OHIO

COMPRESSORS: RECIPROCATING AND CENTRIFUGAL
ENGINES: GAS - DIESEL - GAS-DIESEL
JET-POWERED GAS TURBINES

For more information write in No. 2

NOW . . . faster trips . . . bigger payloads . . . greater savings *with complete braking safety!*



The Jacobs Engine Brake can be installed with vehicle down time of 4 hours or less.

SAFETY PLUS SAVINGS!

- Increased brake lining and drum life—well over *double the life* in many cases.
- Longer tire life.
- Less fuel consumption—increased oil life.
- Less engine maintenance.
- Easier engine run-in.
- HIGHER DOWNHILL SPEED WITH COMPLETE SAFETY—FASTER SCHEDULES—EXTRA HOURS OF OPERATING TIME!

NEW JACOBS DIESEL ENGINE BRAKE

. . . one of the great over-the-road economy advancements

The Jacobs Engine Brake gives any diesel transport complete and separate braking *independent of existing brakes.* It converts the engine into an air pump which makes use of every ounce of braking power that a diesel engine can produce, with no heat dissipation problems. In short, the Jacobs Engine Brake converts the diesel into a 100% workhorse that can pull its load uphill *and hold it back going downhill!*

Your driver can easily employ the Jacobs Engine Brake without changing his driving habits. Simple controls are located right in the vehicle cab. Best of all, the brake can be installed on standard diesels, 2-cycle engines, and supercharged or turbo-charged engines. At trade-in time, you can shift the brake easily from one truck to another. Or you can put it on leased vehicles.

Write for new catalog. See why the easy-to-install Jacobs Engine Brake is already drawing the attention of fleet operators and vehicle manufacturers throughout the industry.

CLESSIE L. CUMMINS DIVISION
CABLE: JACOBSCHUCK
diesel products
THE Jacobs MANUFACTURING COMPANY
WEST HARTFORD 10, CONNECTICUT

For more information write in No. 3

How United Motors Service helps you get better fleet performance from your Delco-Remy equipment

It's as easy as . . .

HELP FROM 39 UMS ZONE SERVICE MANAGERS (see list at right above), providing on-the-spot advice and recommendations on questions involving Delco-Remy equipment.

HELP FROM DELCO-REMY SERVICE MANUALS that give step-by-step analyses of typical maintenance and trouble-shooting procedures. Available from UMS distributors, these manuals make service faster, easier.

These three easy-to-get Delco-Remy services mean reduced downtime, faster maintenance by your shop personnel, and peak performance for your fleet vehicles. How do you get these valuable Delco-Remy service helps?

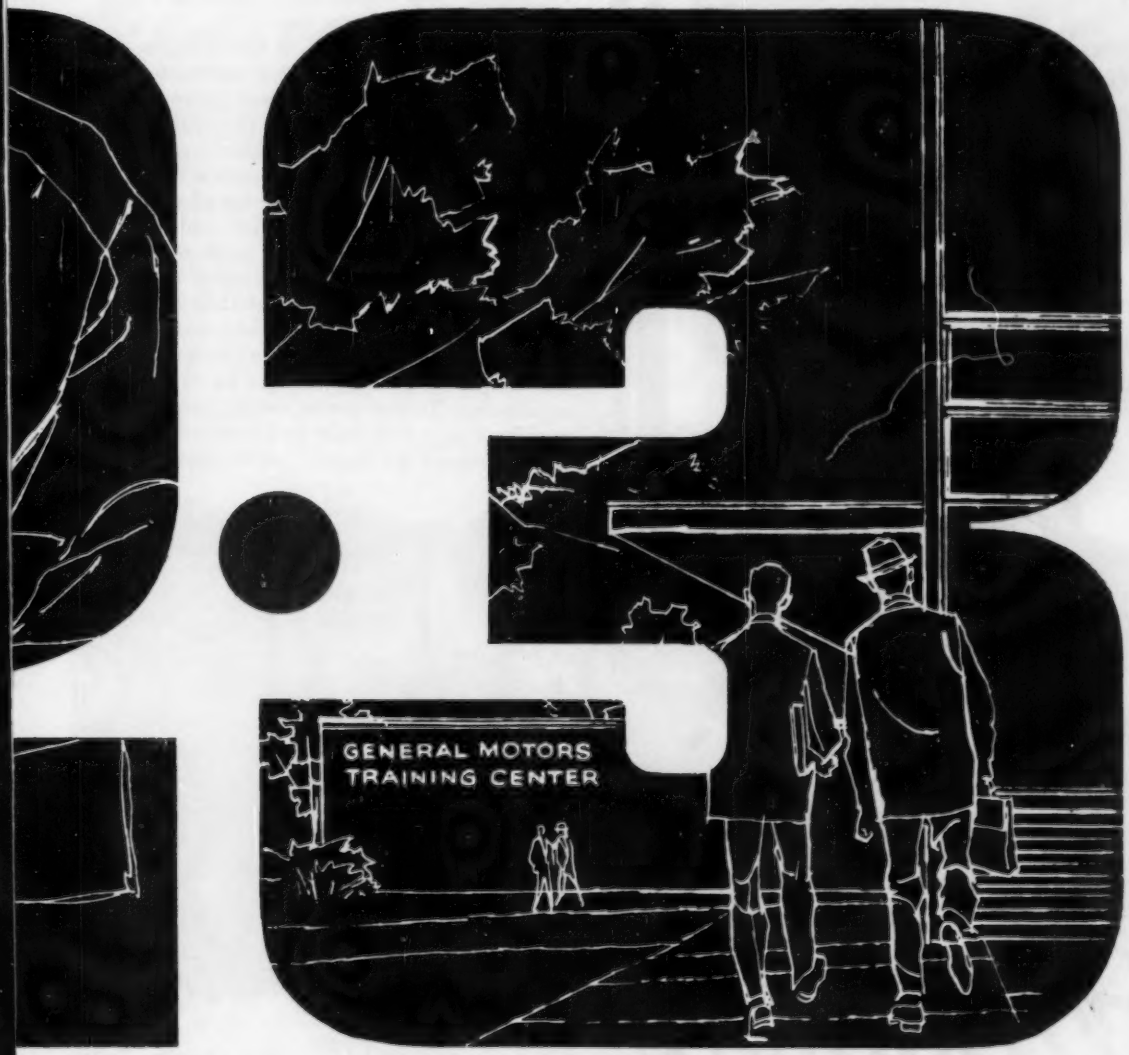
Just ask.

Talk to your local United Motors Service distributor. He'll see that you get the help you need—when you need it! He's also the man to see when you need Delco-Remy original equipment replacement parts. Look over these Delco-Remy services and decide what you need. Then, just ask!

UMS Zone Offices in Atlanta • Boston • Chicago • Detroit • Los Angeles • Minneapolis • Newark • San Francisco • Seattle • Kansas City • Dallas • Cleveland • Denver • Indianapolis • Buffalo • Philadelphia • St. Louis • New Orleans • Pittsburgh • Omaha • Memphis • Cincinnati • Charlotte • Jacksonville • Houston • Milwaukee • Washington, D. C. • El Paso • New York

UNITED MOTORS SERVICE • GENERAL MOTORS CORPORATION

GM U·M·S PARTS SALES UNITED MOTORS SYSTEM

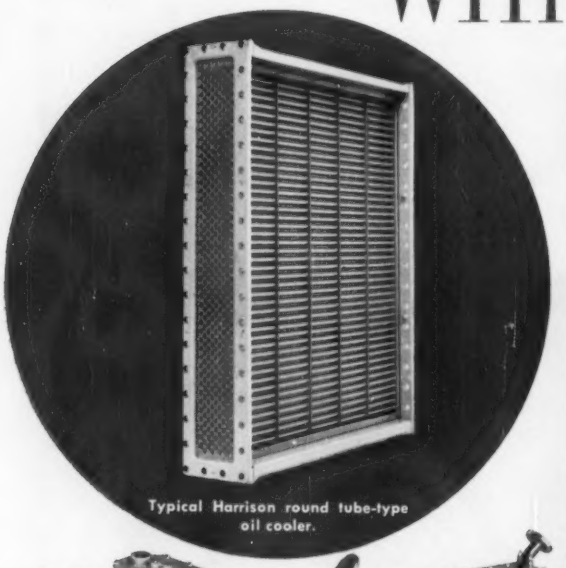


HELP FROM 30 UMS-DELCO-REMY TRAINING SCHOOLS at GM Training Centers that give your service personnel detailed up-to-date information on operation, maintenance and trouble-shooting. The tuition-free courses last for one week and there is no charge for books or class materials.

For more information write in No. 4

General Motors Reliability in Action...

COAL AUGER BORES DEEP WITH COOL POWER



Typical Harrison round tube-type oil cooler.

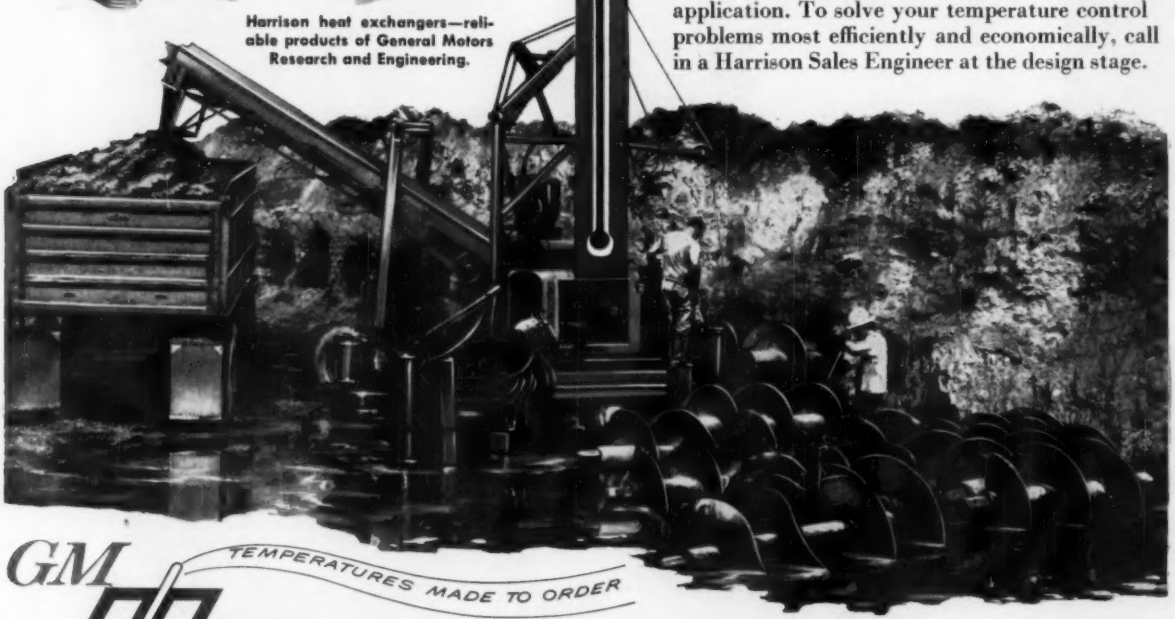
Harrison heat exchangers—reliable products of General Motors Research and Engineering.

GM HARRISON OIL COOLERS PERFORM RELIABLY IN TOUGH DIESEL-POWERED MINING OPERATION

When rock and earth overburden becomes too great for economical coal-stripping in this Ohio mine, an ingenious auger works in a deep trench to "bore" out the coal.

For this rugged job, a GM Diesel engine supplies the power. And a Harrison heat exchanger—built under the most rigorous standards of reliability—keeps the engine oil cool. This reliability—"measurable excellence"—is accurately maintained by a system of scientific controls that cover every phase of product design, development and production. Result: Harrison heat transfer products that perform their functions exactly *right*.

You can get this Harrison reliability in a wide range of basic types of heat transfer construction—a complete line of designs which assures the *right* heat exchanger for every application. To solve your temperature control problems most efficiently and economically, call in a Harrison Sales Engineer at the design stage.



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AIRCRAFT, AUTOMOTIVE, MARINE AND INDUSTRIAL HEAT EXCHANGERS

Free For an informative 48-page brochure on the complete Harrison line . . . write to Department 902

HARRISON RADIATOR DIVISION, GENERAL MOTORS CORPORATION, LOCKPORT, NEW YORK

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diesel power

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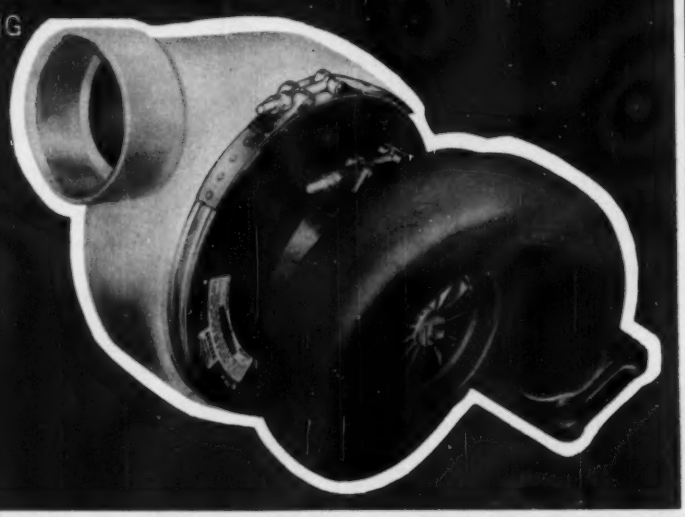

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John Deere "3010" Diesel Row-Crop Utility with integral or pickup plow.

JOHN DEERE DIESEL TRACTORS, IN "NEW GENERATION OF POWER," USE BENDIX FUEL INJECTION NOZZLES

John Deere's newest line of farm tractors, featuring what the company calls a "New Generation of Power," promises a brighter, more profitable future for farmers. To meet the special needs of large-acreage, row-crop farming, Deere has engineered its tractors for more complete control over work time and quality, operating cost, and physical effort.

Features designed to achieve these aims include: New multi-speed Synchro-Range transmission that "tailors" speed and power; demand-type hydraulic system that provides finger-tip equipment control, as well as supplying the power steering and power brakes—the latter a new John Deere "first"; new independent dual-speed power take-off for 540 and 1000 rpm equipment; scientifically designed posture seat.

John Deere builds both 4- and 6-cylinder variable speed engines, in gasoline, diesel and LP-Gas models. On its diesel-powered tractors, Deere uses Bendix® Fuel Nozzles for efficient, dependable diesel fuel injection, with maximum utility and minimum maintenance.

In greater and greater numbers, engine builders rely on Bendix for their needs in diesel fuel injection equipment. Users, too, are assured of continuing satisfaction through our nation-wide organization of distributors and service specialists. When you think of diesel fuel injection equipment, think of Bendix!

Scintilla Division
Sidney, New York

THE Bendix CORPORATION

Export Sales & Service: Bendix International Division, 205 East 42nd St., New York 17, N. Y.

For more information write in No. 7

TOP PISTON POWER FOR DIESEL ENGINES

BOND LOC

STOPS GROOVE WEAR

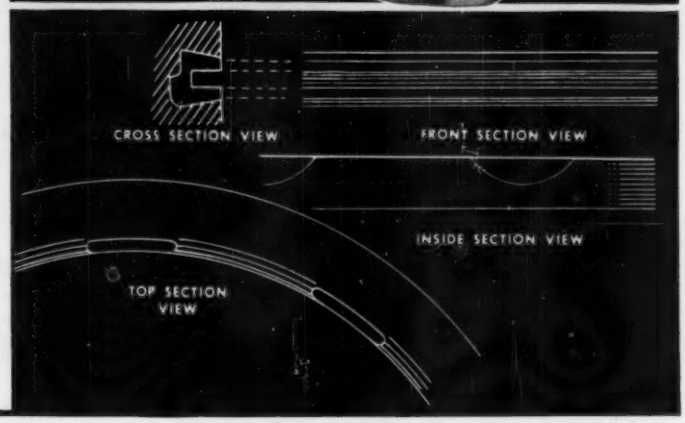
"NI-RESIST" IRON
TOP RING SECTION

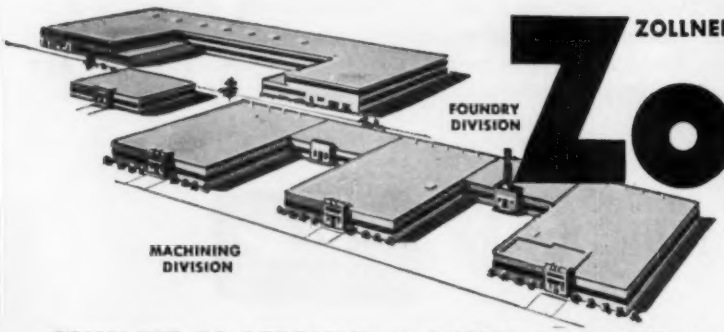
Double Bonded

PERMANENTLY
METALLURGICALLY—Al-Fin Process
MECHANICALLY—Zollner Lock

EXCLUSIVE ADVANTAGES OF ZOLLNER DESIGNED MECHANICAL LOCK

1. Reverse angle designed top ring section with tapered flutes, dovetail locks in all directions
2. Positive mechanical interlock prevents any movement
3. Reduces weight 25% to 30% with lower inertia stresses
4. Increases surface areas carrying inertia load





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ZOLLNER

HEAVY DUTY PISTONS

COMPLETE CO-OPERATION IN ENGINE DEVELOPMENT WITH THE FINEST PISTON FACILITIES

For more information write in No. 8

People Trouble

You've probably heard about the goose that took a ride in a crowded New York subway and got "peopled". But did you ever think about all the equipment around that gets "peopled" too . . . often peopled to death! Service managers can tell you all about it; so can those handling warranty. It almost seems that people are the natural enemies of equipment. Odds are long that people will use equipment as intended and take care of it. What do we mean by "peopled" equipment? You see it in a new dumper that's quickly loaded five tons over rated capacity . . . or put under a shovel where the operator is allowed to drop rock eight feet into it. Then there's the driver losing power with a plugged dry-type air cleaner; he gives it the screwdriver treatment. Or the man who pinches the fuel return line on a Cummins to get more power . . . or the one who sets up his injection pump to 130% maximum fuel. These are just a few . . . we could go on and on and so could you! But recently we saw a real dandy—an important new diesel application that could go down the drain because of people. Sad thing is that when the equipment is not being peopled, performance is reported to be fine. Troubles started with the operators; diesels were new to them. Despite indoctrination, starting troubles cropped up. Weather was moderate, there were glow plugs. Mechanics had no trouble starting the engines but, unexplainably, the operators did. Then there were shutdown problems. Operators would use the solenoid fuel shutoff, forget to turn the switch off and burn out the solenoids! These are only a few of the troubles; others also got into the act. Maintenance bills appeared to be on the fantastic side. Apparently, when any trouble occurred, off came the fuel injection pump for check. How else can you justify several such items on equipment with well under 500 operating hours on the engines? Then there were mysterious "tune-ups". These were billed at figures that even applying a generous hourly rate reflected from four hours work up! With fuel injection work billed separately, what in the world can you do to "tune" a diesel that takes that kind of time . . . particularly on relatively new equipment? As a result of being peopled, this potentially important application may prove uneconomic. The user and the industry suffers. We know of no easy solution to these problems; all you can do is to work on people to try and get them to "care" a little more. So if there's a moral to this editorial it's simply that normal PM, inspections and repair are not enough; time spent working on people can be the most rewarding in keeping down maintenance costs.

B. P. E.

This 21000-powered Bucyrus-Erie dragline is swinging a 3-yd bucket on a stripping operation south of Seagoville, Texas.

H. GLENN BUTLER

CLARK FINDLEY

"20% more production on 40% less fuel with our Allis-Chalmers 21000 diesel"

... says Butler-Findley Co.

Repowering a Bucyrus-Erie 54-B dragline with an Allis-Chalmers 21000 diesel boosted stripping operations 20 percent for Butler-Findley Co., Dallas, according to Clark Findley, superintendent and production manager. "This engine has given a good old machine new life and stamina," said Mr. Findley.

H. Glenn Butler adds, "Not only that, we are realizing fuel savings of over 40 percent! The 21000 uses less than 5 gal. per hour compared with over 8 gal. for engines in our other machines of the same capacity. We get more work done with much less operation expense, which means dollars to us."

If you want to boost production and save money doing it, talk to your dealer about powering with a modern Allis-Chalmers diesel. Allis-Chalmers, Milwaukee 1, Wisconsin. BC-35

ALLIS-CHALMERS

POWER FOR A GROWING WORLD

For more information write in No. 9

diesel power

highlights

STANDARD OIL OF INDIANA GOES NATIONAL

In a move that will bring national distribution under one management, Standard of Indiana has combined operations of the parent company and its affiliates, American Oil Co. (Amoco) in the east and Utah Oil Co. (Utoco) in the west. Now a leading distributor in the mid-west, the American sign will, according to top company management, compete aggressively for consumer, commercial and industrial accounts in all of the 50 states.

DIESEL WHEEL-TRACTORS OUTPACE GASOLINE POWER

Current Industrial Reports as published by U. S. Dept. of Commerce show that wheel-type tractors (except contractors' off-highway type and garden tractors) produced during March were 10,560 gasoline and 10,590 diesel powered . . . A slight margin, but enough to carry the day.

WORLD'S SLOWEST RAILROAD

Five diesel locomotives operating at Redstone Arsenal, home of the supersonic missile, do so much twisting and turning that maximum allowable speed is seldom reached. Limit is 25-mph on the straights, 10-mph on the turns . . . Railroad, despite lack of speed, logged 50,000 miles last year, hauled 380,000 tons of cargo . . . This cargo is poison gas, 500-lb bombs, smoke pots and an assortment of chemicals and missile-related items . . . Once, it hauled a passenger. A "knight of the road" was hauled into the reservation while he was asleep in a boxcar. He was not charged for the ride.

MILEPOST OF DEUTZ PRODUCTION

Up to the end of last year well over 400,000 Deutz air-cooled diesel engines have been sold. This represents over 1,200,000 cylinders with a total output of about 20,000,000 horsepower.

ON THE DIESEL AND THE SMOG PROBLEM

According to Air Pollution Control District in Los Angeles, a city with good reason to be an authority on smog, a diesel bus engine emits only one-sixth as much pollution to the atmosphere as does a gasoline bus engine without a control device. Commenting on 170 new diesel-engined buses purchased by the city, control officer Smith Griswold stated that the diesels emit 1.1 tons/day, while gasoline-engined buses would have emitted 6.7 tons/day of contaminants.

HIGHWAY CONSTRUCTION COSTS DOWN

Private Truck Council Of America, Inc. reports highway construction costs, first quarter 1961, 1.2% below previous quarter.

WHITE MOTOR CO. INTRODUCES COMPACT DIESEL TRUCK LINE

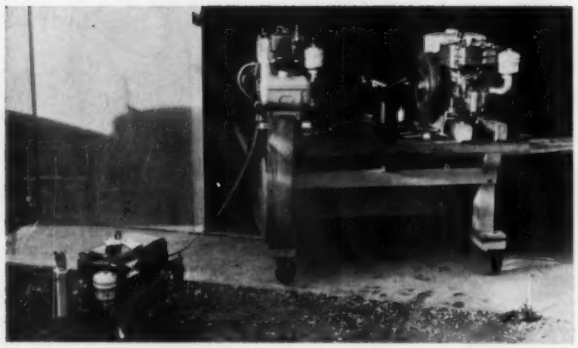
White introduced a series of compact trucks and tractor units designed for stop-and-go operation in cities and terminal areas. Power is Cummins JNF-130 as standard, or CF-160 as option.

PETROLEUM INDUSTRY AND NATURALISTS CO-EXIST COMPATIBLY

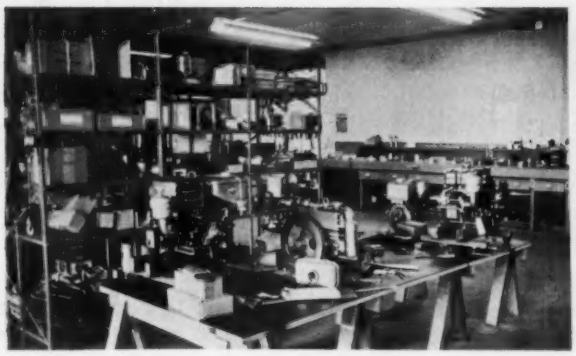
Petroleum Today magazine points out that cooperation between seemingly divergent interests can work for the betterment of both. Oil rigs sunk off the California coast attracted fish where they'd never ventured before, and one oil company was cited by the Audubon Society when it changed the site of a test-drilling so as not to disturb a colony of whooping cranes. The trend is toward amicability.

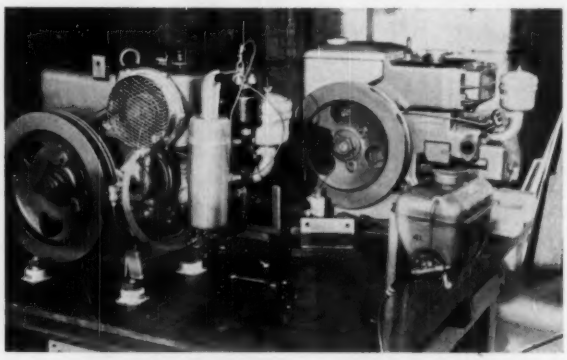
diesel power

news section

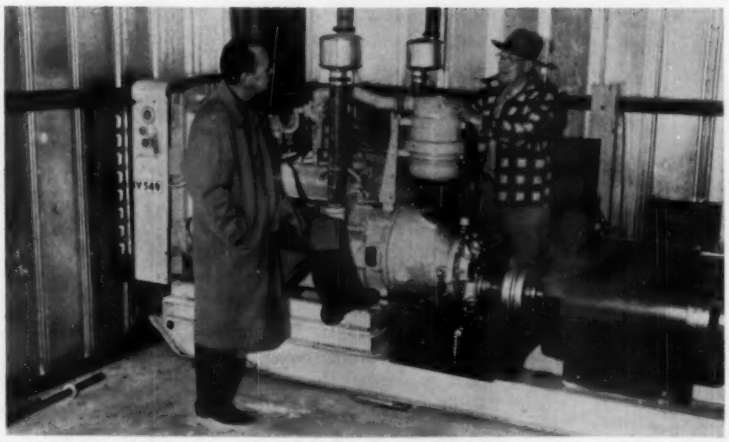


Assembly and Run-In
Components and assemblies for Yanmar diesels are brought in from Japan, assembled in Los Angeles by Continental Machinery Corp. Bottom left, engines are bench assembled. Below, engines are prepared for test run. Left, two engines are run on bench while third runs on ground. Little engine runs, unmoun'ed after being fed only the fuel lines.





Station Standby
Chet Wallack (left) engineer with KKTV, Colorado Springs, Colorado, inspects standby UV-549 diesel. With him is Homer Campbell, of H. W. Moore Equipment Co. With transmitter atop 9400-ft peak, storm damage is a threat to transmission. Standby generator removes threat of power loss. Engine comes to speed in seven seconds, with full 72-kw.



Simms Wins Big American Order

Simms has revealed that in the early part of last year they were awarded a large contract by Ford Motor Co. of Detroit. They are to supply all the fuel injection equipment on Ford's 6-cyl diesel engine that powers the new Ford tractors. Deliveries began toward the end of last year.

Acquisition

An application by Ryder Lines, Inc. to acquire the assets and operating authority of the 40-state York tank line companies of Houston has been approved by Division 4 of the ICC. If there are no objections, the division's order will become final within 30-days and the transaction will be consumated shortly thereafter.

New ICEI Officers

At the February meeting of the Internal Combustion Engine Institute, new officers were elected. These are: President—C. E. Nelson (Waukesha); Vice-President — Phil Norton (Wisconsin); Secretary — David W. Onan II (Onan); Treasurer—E. V. Oehler (Briggs & Stratton); Director—G. Waine Thomas (Continental); and Exec. Secretary —Charles G. Spice.

Truck Lease

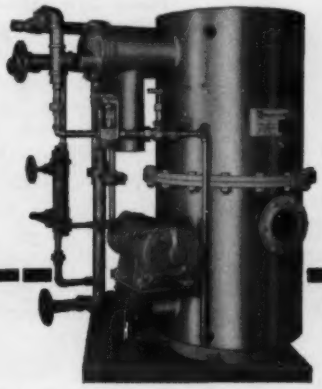
Nine more Kenworth trucks have been ordered by Texas Leasing Co. for use by Texas-Arizona Motor Freight, with routes through Texas, Arizona and California. These are cab-over-engine K-522's with tilt cab, three-axle single-rear-axle-drive and ten-speed gearbox. Engine is Cummins NH-220 diesel.

Pollution

Using a complex of metallic compounds developed during research on solid fuel propellants, Harco Chemical Co. has come up with a tool in the fight against industrial air pollution. Their combustion catalyst is claimed to promote complete combustion of fuels, almost entirely eliminating smoke, soot scale and stack emissions. According to Harco, the catalyst can be modified to act as a highly effective carbon scavenger for diesel fuels, especially useful with high sulphur-vanadium content oils.

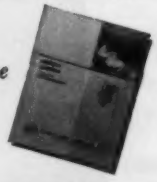
FRESH WATER

FUEL-FREE TO DIESEL OWNERS



Wherever there is a diesel and a source of salt or brackish water, fresh water exceeding U.S. Public Health Service requirements can be made simply and at low cost with an AMF-Maxim Aquavap heat recovery evaporator. These evaporators, operating on engine jacket water or any other hot water source, add nothing to existing fuel costs. They are low in initial cost, inexpensive to maintain and simple to operate. They are delivered as complete packaged units, ready to install, and are extremely compact. A 1000 gallons per day Aquavap, for example, is less than 4 feet high and takes laterally about 2 x 4 feet of floor or deck space. Aquavaps are available with capacities ranging from 150 to 12,500 gallons per day.

For further details write Dept. D for the new illustrated Aquavap Bulletin.



AMF MAXIM EVAPORATOR DIVISION
American Machine & Foundry Company
WATERFORD, CONN. • Branch, DENVER, COLO.

For more information write in No. 10

International Truck, Trailer & Equipment Show

Exhibitors have already filled just about all the available booths for the ITTE Show to be held in Brooks Exhibit Hall, San Francisco, June 28, 29 & 30. These include leading manufacturers and suppliers both American and foreign. All types of equipment and services pertaining to highway transport will be on display. Show Committee is made up of 29 presidents of western trucking companies which, collectively, purchase more than $100 million in truck equipment annually.

Custom Turbo Cleaners

Garrett's AiResearch Div. is now using a custom-designed apparatus to make sure that turbos that go out are not just clean, but double clean. Their engineers find this necessary with wheels that spin to 90,000-rpm.

No Traffic Problem Here

Traffic converging on Washington Circle, in Washington, D. C., could not be detoured for the building of the "K" Street expressway. Contractor, Blackwell Construction Co., selected a McKiernan-Terry DE-30 diesel pile hammer to solve his tight-spot problems. Found it took less space, cut his rig-up and rig-down time, too.

Temp Symposium

A symposium on temperature—its measurement and control in science and industry—was held in Columbus, sponsored by American Institute of Physics, Instrument Society of America and National Bureau of Standards. Nine hundred attended from U. S. and overseas, including Russia. Over 250 papers were presented, covering a wide range of topics. W. A. Wildhack of NBS was general chairman of the symposium.

KATO A.C. GENERATORS

KNOWN FOR LONG, DEPENDABLE SERVICE!

- CUSTOM ENGINEERED to your exact requirements.
- NOW 500 WATTS TO 1,000 KVA
- ADAPTABLE TO ANY INDUSTRIAL ENGINE

With new rugged E-157 FRAME the Kato Generator line has been extended to 1,000 KVA. Each is built with the same careful craftsmanship and top quality materials for which KATO has been known since 1928.

UNIFORM QUALITY is achieved by constant, thorough supervisory checks throughout production.

LONG LIFE is assured because Kato Generator design and capacity allow for characteristics beyond normal requirements.

ALSO KATO MOTOR GENERATOR SETS, HIGH FREQUENCY GENERATORS, D.C. GENERATORS, ROTARY CONVERTERS, POWER CONVERTING SYSTEMS.

CSA APPROVED

NEW! E-157 FRAME complete with all controls, couplings for the engine of your choice.

Builders of Fine Rotating Electrical Machinery Since 1928!

Write or phone concerning your specific requirements!

KATO ENGINEERING COMPANY

1408 FIRST AVENUE, MANKATO, MINNESOTA—Phone 8-2941

For more information write in No. 11

Pepping Up Injection Service

American Bosch has started a sales promotion program that will help their distributor organization sell more service by working closely with them. Plan is to give the service organization ideas that will help them stage their own promotions. Result is an American Bosch diesel fuel injection Service Promotion Kit, complete with everything from promotional letters to newspaper advertising mats.

New-Type Locomotive

The first of a new type of locomotive was handed over to British Railways by the manufacturer, Beyer Peacock (Hymek) Ltd. The D-7000 is the first of the Type 3 diesel-hydraulic series. Power is by Bristol-Siddeley MD-870 engine, a 4-stroke V-16 turbocharged and aftercooled diesel, rated 1920-hp @ 1500-rpm.

Fleet Maintenance Exposition Back

The Fleet Maintenance Exposition will be held at the New York Coliseum October 23-26. As was its predecessor, this exhibition will be tailored exclusively to meet the varied maintenance needs of the nation's private for-hire carriers and government motor fleets.

More Macks

Mack Trucks will step up its production by 30%, starting early June. According to Mack VP Crockett, a mounting backlog of orders has made the production boost necessary.

New Construction & Modernization

Nineteen conference sessions covering virtually every major problem which both large and small companies face when they construct new facilities will feature the second Industrial Building Exposition and Congress. Scheduled for New York Coliseum, Sept. 25-28th. Modernization as well as new construction will be considered. Two floors of exhibits will complement the discussions, which even gets into financing problems.

Top Canadian

After a close race among distributor and dealer personnel who are members of GM Diesel Ltd's Service Craftsman's Guild, top honor in Canada was earned by Norman E. Hewitt of Waterous Equipment Ltd. of Alberta. Guild members are experts in the maintenance and servicing of GM diesel engines. Awards are made on the basis of grades received in written examinations on service procedures conducted by the London office throughout the year. Six top winners in U. S. have already been named, forming the "North American Seven".

Spring Reminder

Cummins offers a "Spring Cleaning" reminder, to service away some of the residues of winter engine operation before starting on summer operation. Drain and flush cooling system; drain and flush lube oil system (cold operation accumulates sludge); check out the air system; check out fuel system (cold weather caused condensate to form, which may have caused corrosion); and go over the electrical system.

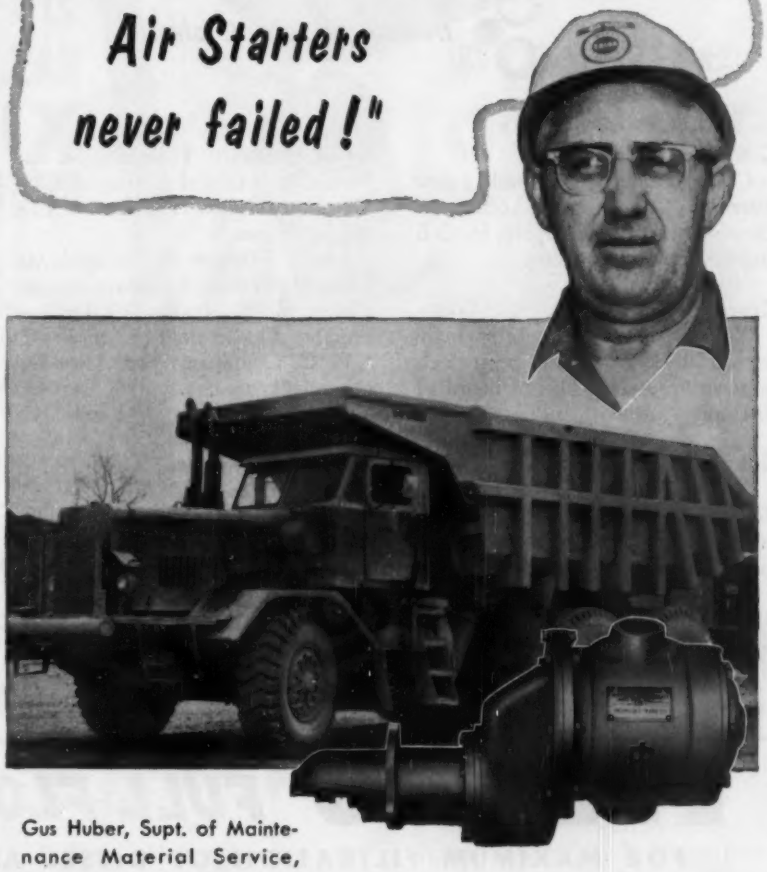
More Power for "Michigan" 380

Clark Equipment has announced two new horsepower-increasing engine option for the "Michigan" 380 Series II tractor dozer. Options are offered, along with other design modifications, to increase productivity. First option is GM's 12V-71, rated 430-hp with 1210-lb/ft torque @ 1200-rpm. Second option is Cummins NVH, rated 450-hp with 1232-lb/ft torque @ 1500-rpm. Previous engine was rated 375-hp.

Cal Conference

Chief test engineer for Thermo King, Earl Melby, spoke at the fifth California Conference on Transport at the University of California. Theme was performance, limitation and capabilities of the new larger-capacity units powered by Mercedes-Benz diesels. Since Thermo King makes both gasoline and diesel-powered units, his comments are based on data. He summed up his remarks with, "But all operators agree that in terms of hours between overhaul the diesel engine performance is far superior to any gasoline engine unit".

"over 11,000 hours on-the-job... Air Starters never failed!"



Gus Huber, Supt. of Maintenance Material Service, Chicago, Illinois, has this to say about Air Starters . . .

"We have Size 20BM Ingersoll-Rand Air Starters on eight of our big Dart dump trucks. These heavy-duty units have been in use for four years and each truck has recorded over 11,000 hours on-the-job. During this time, including the coldest weather, not one of these trucks has ever had a starting failure, and no repairs were necessary!"

Reduce electrical maintenance to an absolute minimum by using modern Ingersoll-Rand Air Starters. They produce surer, faster starts and are unaffected by extreme weather conditions.

Ingersoll-Rand Starters are made in 4 sizes for starting diesel, or carbureted engines from 300 cu. in. to 20,000 cu. in. displacement. For complete information on these efficient starters . . . write for your copy of "Go Modern—Start with Air," Form 5094E.

Ingersoll-Rand

223A-18

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For more information write in No. 12

diesel power

news—people & plants

C-B Opens Warehouse

Cooper-Bessemer will build a new warehouse and service office in Omaha, to stock repair parts for C-B engines and compressors.

Crockett Mack V-P

Albert G. Crockett, sales manager of Mack Trucks, has been elected a vice-president by the board of directors.

Cat Shuffles Execs

At Caterpillar, two vice-presidents, Gail E. Spain (foreign marketing), and Henry W. Howard (Engine Division) have retired.

V-P W. J. McBrian will succeed Mr. Spain, and also become president of the subsidiary companies Caterpillar Americas and Caterpillar of Delaware. Formerly, he had been chairman and managing director of Caterpillar Tractor Co. Ltd. (Great Britain).

Lee L. Morgan will succeed Mr. Howard, and also assume responsibility for the company's Defense Products Department.

E. C. Chapman, Asst. Sales Development manager, will succeed Mr. Morgan as Sales Dept. manager.

Cleveland Graphite Decentralizes

Cleveland Graphite Bronze, Div. of Clevite, has decentralized its manufacturing activities, forming four groups. These are automotive bearing operations; bushing operations; heavy bearings operations; and materials fabricating operations.

C-B Buys Kline

Cooper-Bessemer has purchased Kline Manufacturing Co., manufacturer of hydraulic pumps and motors. It will be carried under its own name and management as a wholly-owned subsidiary.

J. W. Carlson

A-C Gen. Mgr.

John W. Carlson has been appointed general manager of Allis-Chalmers' Engine-Material Handling Div. He succeeds L. C. Daniels who, in anticipation of retirement, asked to be relieved of the duties.

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FOR MAXIMUM FILTRATION OF DIESEL AND GAS ENGINE LUBRICATING OIL, FUEL OIL AND GAS FUEL...

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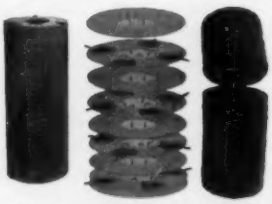

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Diesel Parts come CLEAN with LIX CLEANERS

Remove encrusted carbon or burned-on varnish from diesel parts without scraping or brushing. Lix Cleaners save valuable man-hours by thoroughly and safely soaking away carbon and grease. Whatever your diesel cleaning job, vital engine parts or exterior surfaces, there is a LIX Cleaner that will DO IT BETTER and SAVE YOU MONEY.

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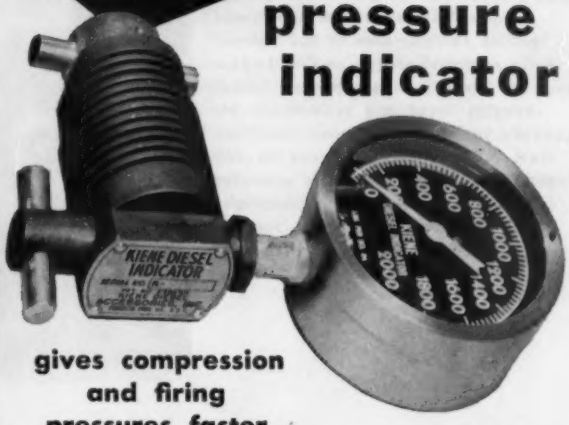
For more information write in No. 14

KIENE® DIESEL

pressure indicator



gives compression and firing pressures faster

The Model K-100 Kiene Pressure Indicator accurately measures compression and firing pressures — assures proper maintenance of diesel engines — helps prevent costly down time. Only one moving part—no friction or inertia effects—no complicated adjustments. Steel carrying case and service tools included.

Send for Bulletin K-100

KIENE DIESEL ACCESSORIES, INC.

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For more information write in No. 15

Autolite V-P

Earl R. Fiene is appointed vice-president and director of sales for Electric Autolite, directing automotive original equipment and replacement sales.

GM Distributor

GM's Detroit Diesel has named Pacific Diesel Power Co. distributor for the division's line of trucks, industrial and marine engines in western Oregon and southern Wash.

Perfect Circle V-P

Drex D. Minshall has been named vice-president, Marketing, for Perfect Circle. The position is newly-created.

Mutual Support

An agreement of mutual support in engineering and marketing of automated control systems and processes has been announced by Allis-Chalmers, Consolidated Systems Corp. and International Business Machines (IBM). The three will work together when it is in the best interest of the customer.

Perfect Circle Acquires Interest

Perfect Circle has acquired a substantial financial interest in Floquet-Monopole, S.A., largest French manufacturer of piston rings, pistons, valves and sleeves. F-M supplies most original equipment to French manufacturers, and also replacement parts.

In Memorium

George W. Codrington, retired vice-president of GMC and a leading figure in the marine diesel field, died in his sleep in his winter home at Daytona Beach. He was 74 years old.

Mr. Codrington's diesel career dates back to 1917, when he joined Winton Engine Corporation. The company had been founded by Alexander Winton, developer of the first all-American diesel engine built in this country. In 1938, when Winton became Cleveland Diesel (GM), he took the title General Manager, was later elected a GM vice-president.

New Dept.

Oxy-Catalyst, Inc. has formed an Industrial Dept. C. T. Hayes, former sales manager for industrial catalysts, had been named manager.

Donaldson Builds

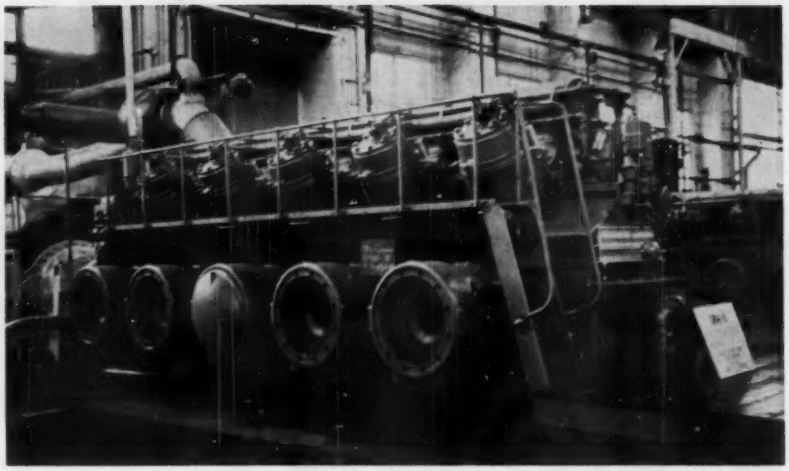
Donaldson Co. has announced plans for a $750,000 general office building and research center in Bloomington, Minn.

Clayton Opens Swiss Office

Clayton Manufacturing Co. has established a subsidiary company, Clayton S.A., in Lausanne, Switzerland, to serve as sales, accounting and engineering center for European and Mediterranean areas.

Alco Rep

L. A. Christopher Co. has been appointed by Alco Products as exclusive manufacturer's rep for Alcotwin finned-tube heat exchangers and related equipment in the Rocky Mountain area. Offices are in Denver, Farmington, N.M., and North Salt Lake, Utah.



GMVG-10 2-cycle engine running with Cooper-Bessemer's new electronic ignition system. Also, it has fuel-air ratio controls, proven on C-B 4-cycle engines. These maintain proper turbocharging level and scavenging air quantity for any load/speed condition from half-speed, half-torque to full speed, 110% load. Controller operates in series a turbocharger exhaust-gas by-pass and air throttle control. Ignition timing is also varied for smooth combustion.

Cooper-Bessemer's power and compression "roundup"

Highlights of a week-long display of C-B's latest developments in heavy-duty engines, compressors and automatic controls.

Several new items, results of C-B's continuous research and development, reached the product stage in May. Also a lot of interesting work was going through the shops. Thinking that this would be an excellent time for a "Power and Compression Roundup", Cooper-Bessemer invited their customers to visit both the Mt. Vernon, Ohio, and Grove City, Pa. shops.

All through the week of May 15th guests passed through the plant in well-planned waves. The "10-gallon" hats provided by C-B pointed up the "Roundup" theme. Highlights of what they saw are illustrated. Others, not shown, will be summarized.

For example, they saw the prototype of an en-bloc integral angle compressor engine. This is a 2-cycle 18-in. x 20-in. gas engine to be built in 6, 8, 10, 12 and 16-cyl models for the natural gas transmission and petrochemical industries. Rigid en-bloc construction lends itself to larger power packages, for example, the 16-cyl unit with up to eight compressor cylinders.

As to compressors, they showed their new AMA model, a short-stroke 2 or 4-cyl unit for gas lift, field gathering, boosting and injection. These are packaged (in their case with a Climax engine) by CB/Southern, a subsidiary in Houston, Texas.

There was also the recently-introduced 2 and 3-cyl DMR compressor developed for general plant air supply and for boiler soot blowing. En-Tronic controls are provided so that at the push of a button the unit will start, load and regulate output automatically to the system's needs. Controls can be arranged for fully unattended operation.

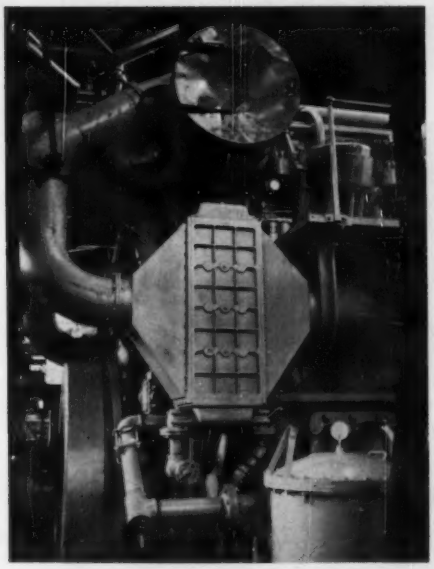
Two centrifugal compressors were shown. One, the RB-7B, is a multi-stage unit with 4 to 8 stages. The second compressor is the RFB24. This is a single-stage unit designed exclusively for gas pipeline transmission work.

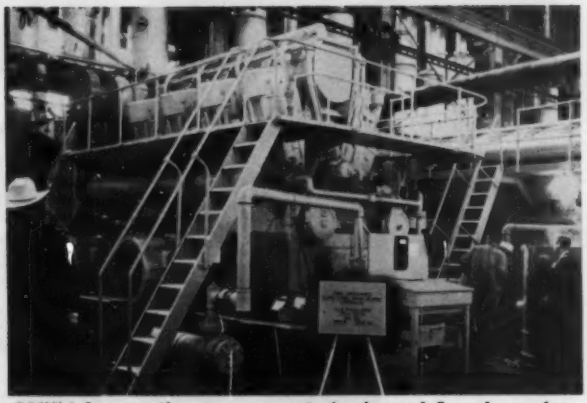
The JX expansion engine was another point of interest. Pressurized gases are expanded in the engine and power obtained in the process is put back into the compressor drive. The extremely low temperature exhaust is used for refrigeration in any type of gas separation facility, also in liquification of gases where refrigeration is a requisite.

Their RT-248 jet-powered industrial gas turbine was also on display. In addition to this 10,500-hp unit, a smaller 2500-hp model RT-129 was shown in mock-up form. This is expected to be available next year.

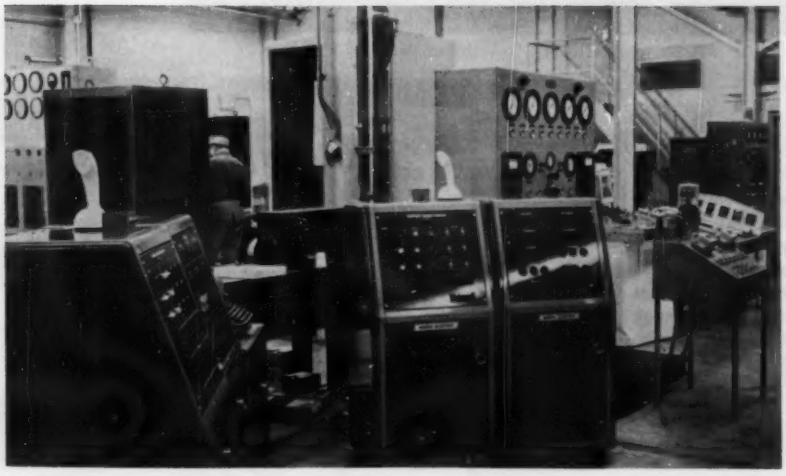
Of course, there were a lot of standard products and extensive facilities to be seen. However, one item that warrants special comment concerns people. The number of young engineers in evidence and their obvious enthusiasm was impressive. They served as guides, performed and explained demonstrations. With all this new blood, guided by C-B's capable veterans, it looks like Cooper-Bessemer is not only planning for the future but will be ready for it.

KVS-16 is a brand new 13½-in. x 16½-in. 4-cycle engine built with 12 or 16 cylinders in gas, dual-fuel, diesel or tri-fuel executions. Horsepower range is 2970 to 4280; rpm range from 450 to 514. Despite high hp/wgt ratio, mechanical loadings are well below accepted values. Advanced design features include velocity cooling of liners to decrease wear and prolong ring life. Note single turbo with twin turbocoolers.

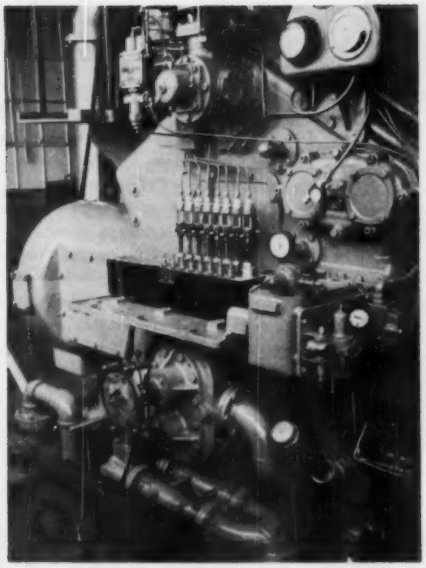




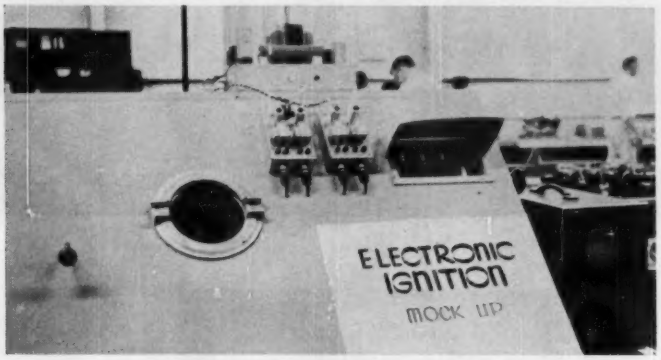
GMWA-8 operating as a pure turbocharged 2-cycle engine. Turbocharger replaces conventional series system with turbocharger and engine-driven centrifugal blower. Assist to turbo during starting is given by three air jets, never required for over five minutes on a cold start. Turbocharger and aftercooler system is at left. This development program is still in progress, although well along.

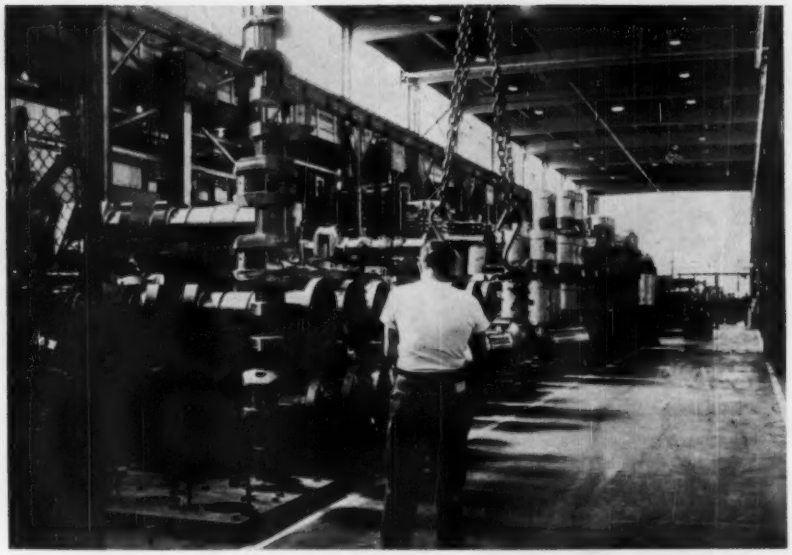


En-Tronic Controls Division demonstrated the completeness and versatility of their systems. Basically, these range from alarm and shut-down controls to fully-automatic, multi-engine plant control systems. Their newest product, engineered to each customer's requirements, provides automatic sequencing control of a compressor station's units. Station operator or pipeline dispatcher has pushbutton control. Also, their new Versudi Controller will maintain full rated torque on an engine over its speed range and prevents overloading. Pumping capacity is controlled by engine speed, torque by the Versudi Controller

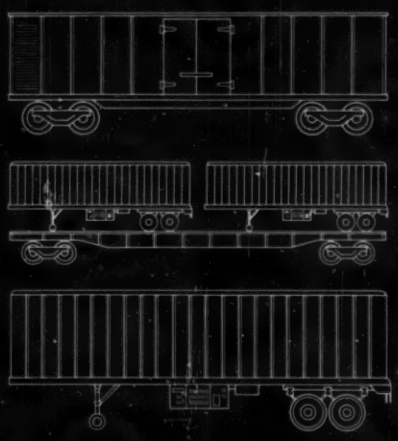


New Electronic Ignition System consists of a velocity-type magnetic pickup (on gear pump of engine at left) a power supply and a patent-applied-for amplifier-driver unit (seen in mockup below). Timing is reported accurate with no drift. The only part that might be expected to "wear" is the thyratron tube and this is easily replaced. A signal from the magnetic pickup (under explosion-proof cover in mockup) is amplified and triggers the thyratron. This fires the ignition coil that produces a hot short spark for excellent ignition efficiency and longer plug life. Mockup demonstrated spark obtained and oscilloscope trace, right, showed timing accuracy.





Functioning of C-B's streamlined and efficient parts handling system is explained, right. Plus assuring parts availability, intensive work on parts processing and use of lighter, more effective packaging assures that customers get parts in better condition and at lower shipping cost. Above, one section for storage of heavy and bulky engine parts.



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Today's Diesel Man...

". . . we can't afford any trouble and can't tolerate breakdown."

"There is no way to know what's going on in the shop by standing back and watching. Besides, we're a small enough company to keep close control, and everybody works. Together these keep maintenance quality up and maintenance costs down."

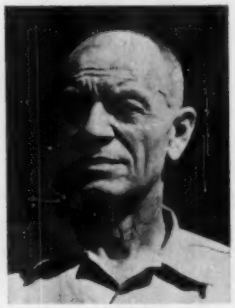
Tom Di Roma, with the last of the morning's trucks turning out into the street to pick up the Connecticut Turnpike two blocks away, sat for a moment. "The trucks that run into New York City have to be perfect in every detail, right down to the last light bulb. It takes time. Naturally, we try to cut this down by a system."

Tom is vice-president for maintenance with Froehlich Transportation Co., Inc., Stamford, Conn. Froehlich Transportation is run by Frank Froehlich, company president, and a man who knows every operation in his company. On occasion, he still climbs in to do one of them. Frank's son, Allen Froehlich, is also a vice-president who serves as terminal manager. He handles the freight and the Personnel. Tom's responsibility is the equipment—trucks, trailers, components, lube, fuel, refrigerator units,—in other words, the fleet.

Tom Di Roma has been in, under, on and around trucks for more years than he'd like to admit. In fact, trucking is the only business he's been in since he was 17 years old. Twelve years ago, Tom joined Froehlich as a driver. Three years later, he was made a mechanic, and as his skills increased he was promoted to Service Manager. Then, as the job engendered more and more responsibility, he was made Vice-President, Maintenance.

Froehlich's fleet of 25 trucks are used for medium-load highway service with a lot of traffic and stop-and-go. Two Macks B 67's haul bread to Binghamton, N. Y., cover 420 miles per day. Three Mack 6-75's deliver bread to Albany, Pittsfield and lower N. Y. State, covering 365 miles per day. Thirteen Cummins-powered Whites deliver perishables to New York City, Jersey, Hartford and parts of Massachusetts.

Froehlichs' fleet consists of (3) B 67 Macks; (3) B 75 Macks; (13) Whites with Cummins engines (one 220-hp — five 195 hp — seven 180-hp units); and six gasoline jobs (B 42 and B 60 Macks).



Tom Di Roma is an expert at his job. He has complete freedom in how he is going to keep our fleet running. The mileage we accumulate before overhaul—and with a minimum of maintenance—justifies our complete trust.

Frank Froehlich, Pres.
Froehlich Trans. Co.

"Until 5 or 6 years ago, we ran all gasoline engines. Then, when we started putting on a lot of mileage with relatively long hauls, we had to go to diesel because of fuel costs. The trip to Hartford, for example, took 82-83 gallons of gasoline. We make the same trip on 27 gallons of diesel fuel. Also, gasoline engines don't stand up to severe service, and we get much better mileage on the short-haul in-city runs, too.

"We still have need for a few gasoline engined trucks. At the egg market, the trucks are started, run for a minute or so to move to a new location, then shut down. Engines are cranked maybe a hundred times a day, with little or no running in between. With the diesels, starter drain on the batteries is severe."

Ninety percent of the hauling is perishables, which breaks down to 40% bread, 50% other perishables (butter, eggs, meat, cheese); the remainder is classified as freight. Thus, 90% of haulage is in reefers. Refrigeration units are Thermo-Kings, mounted outside over the tractor cab.

"All our Thermo-Kings are now gasoline-engine powered. We'd like to go diesel, and we definitely will.

Tires can be a cost item, too. By keeping proper inflation pressures, maintenance when needed and frequent inspection, Tom gets two recaps per tire, averages 87,000 miles per cap. As tires get older and less reliable, they go on trailer.

With our cargo, we can't afford any trouble and can't tolerate breakdown. The reason we're not diesel already is that we can wait for prices to come down. When we do go diesel, though, they'll probably be Mercedes-Benz powered Thermo Kings. From what I can see now, without having given it any study, accessibility of the whole unit is much better, and I like front mounts."

Purchasing

"In order to control who buys what, all purchases go out over my signature—that includes even office supplies. On big items—say a half-dozen new tractors—the three of us sit down to draw up the specs on what we need, relative to initial cost, after-purchase maintenance, and what it will be hauling where." To help him make these decisions, Tom keeps posted by reading trade magazines such as Fleet Owner and Diesel Power. ("I read every word of Diesel Power every month") and by going to every diesel lecture course he can. As Tom says, "Anything about diesels, I want to learn. My job is to keep the fleet rolling."

Driver reports form the basis for many minor adjustments. On occasion, Tom has diagnosed minor breakdowns of components over the phone, helping driver make emergency repair on road.

PM

"Keeping the diesels on the road never presented a problem, even though none of them are youngsters. One White 4400 with Cummins 180 engine has over 350,000 miles, and the engine's never been down. All the others have over 100,000 miles—mostly in city traffic, and we've never lost a cargo or had an engine failure on the road. The diesels have been 100%. We have things go wrong, such as maybe a clutch going out or a control rod breaking, but never with the engines.

"We don't over maintain the equipment. We're small enough to keep good control, and we know every piece. I don't have budget limitations as such, since I set my own, but I do only what I know is necessary to keep everything moving smoothly. Our record system is simple, but effective."

Tom's records are held in a single file cabinet to the immediate right of his desk. Each vehicle's file is in a simple folder that lists lube, oil change, filter change, and vehicle maintenance history. The complete file on each vehicle, since the day it was put into service, is in the cabinet for quick reference.

"We change oil and filter at 7,000 miles, with a second filter change in between. We did use by-pass filters, but went to full flow which, combined with frequent filter element change, stretches oil life. We use Texaco DT-303 lube oil.

"Once a month, by the calendar, trucks are lubed. This one-month period incidentally, hits the oil change period just right for the Whites. We use the standard elements recommended by the manufacturers. While the trucks are in for scheduled service, we inspect them and take care of any items our drivers have reported.

"Our air filters don't present too much of a problem with our use. Here again we use the standard units and we've found that by cleaning them once a week, religiously, we have plenty of margin for safety.

Specialty and Heavy Maintenance

"We take care of PM and light maintenance, but we can't justify doing our own rebuild, and certainly not

the injection work. This is farmed out. Besides, there isn't that much to do. In spite of a couple of hundred thousand miles on the engines, we haven't had to do any serious work on them.

"The problems we have in our shop are, I suppose, the same as in any shop. We have a tough time getting the mechanics to clean up the shop after one job before they start another. After I make a point of it, they're pretty good about it for three or four days. Other problems are small, and we find answers as we go along.

"For example, we use Fuller Road Ranger R-96's on all the Whites. The Macks' have duplex, except for one B 67 with a triple. (This truck and gearbox, incidentally, has over 200,000 miles on it without trouble.)

"Going back to the Fullers, they're a good gearbox and have given us absolutely no trouble. One problem was with the 2-speed-range shift cable. It was binding, and the tip-end would pull off regularly. We discovered that during installation the mechanic was tightening up too much on the cable housing, causing the cable to bind. When the cable was pulled too hard too many times on the road the tip end gave up.

"Now they're not put in as tightly any more, and we lubricate the cable and housing once a month, with regular chassis lubrication, using penetrating oil. At the same time, the 2-speed air governor box is removed and lubricated.

"Another little thing that bothered us was trouble with the P-T pump solenoid. It's mounted on the firewall with the lead wire attached in such a way that engine vibration and road shock caused chaffing. If this wire shorts, it can burn out a lot of wiring. We brought a new lead from the switch along the outside of the firewall to the pump, attaching it so that it will stay out of trouble."

"Aside from these little things, we are very careful with the cooling system. We've found that proper temperature is important, and we make sure the shutters are operating properly, too. Engine water temperature is kept at 180°. At 160° or 170°, the engines just don't perform.

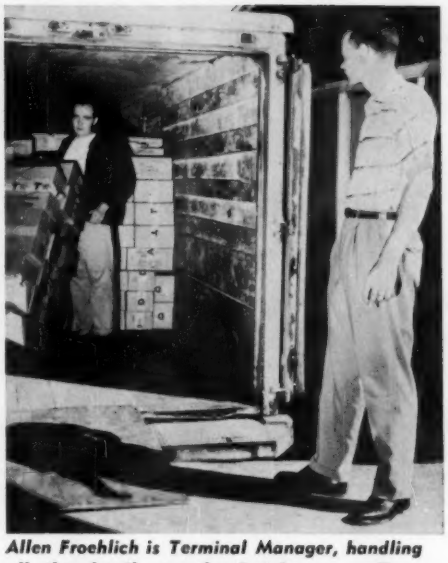
Inventory

"You might say I substitute philosophy for parts inventory. I believe—and my experience has proved—that a properly-maintained diesel engine will give you trouble-free service almost indefinitely. We've yet to have our first road breakdown attributable to the diesels despite steady usage.

"But little things do go wrong. We keep spare starters, generators, hoses, belts—all the consumable items—on hand, ready to go in if needed. Of course, we're close to suppliers and have no need to carry very much here.

"As far as parts for the engines themselves are concerned, for all practical purposes we don't keep any on hand. No need to. Our diesels have been running for years and we have never needed anything. It doesn't pay us to keep an inventory because the records prove we don't need it. If we did we can get it quickly, and we farm out major rebuilds anyway.

"Well-maintained equipment keeps running. For example, during that last big snowstorm, when the roads were tied up so badly that New York City stopped all private traffic, our diesels ran four days without stopping, delivering every piece of freight we had. Storm or no storm, people have to eat. In order to keep the diesels going, we set up refueling on the run. Fuel tanks were filled by hand from cans while we stood knee-deep in snow."



Allen Froehlich is Terminal Manager, handling all the details on the freight, as well as the personnel. With perishables, prompt departure and on-schedule arrival are important.

Summary

Tom Di Roma is typical of today's dieselman. He is the purchaser, the one to be satisfied by OEM and accessory manufacturer alike because Tom specifies the equipment that his fleet will use. Tom keeps a close, personal control over his fleet, and he's not about to be fooled. His job is to deliver the most for the least, and, as the record shows, he's good at his job.

Froehlich's fleet consists of 12 Macks and 13 Cummins-Powered Whites. All have over 100,000-miles, have never been down for rebuild, have never contributed to a failure on the road. Tom gives them only the PM he knows is essential, no frills.

Monitoring Cylinder Load Balance

Pyrometers, first line of defense against engine malfunction, have gone completely automatic.

Go back 10, 20 or even 30 years and you'd find that pyrometers were considered basic instrumentation for the larger engines. In log sheets for plant data you'd find columns for periodic entry of individual cylinder exhaust temperature readings. Operators would tell you that monitoring these temperatures was one of the surest ways of keeping tabs on what was happening in the engine.

It's no different today . . . in fact, in modern higher-output and higher-rpm engines, monitoring of exhaust gas temperatures is more important than ever. Load balance among cylinders is more critical and when things start to go, they go fast. So need for pyrometer indication has intensified and the element of time has been added. More frequent checks are desirable, continuous monitoring even better.

An added complication is the present trend toward automatic or remote-controlled plants. Here, manual switching and recording are no longer practical. Yet cylinder temperature monitoring is too important to drop, so new instruments and techniques have been developed. Here's what Alnor Instrument Company, a leader in the diesel industry for many years, has done.

Full-Time Monitoring

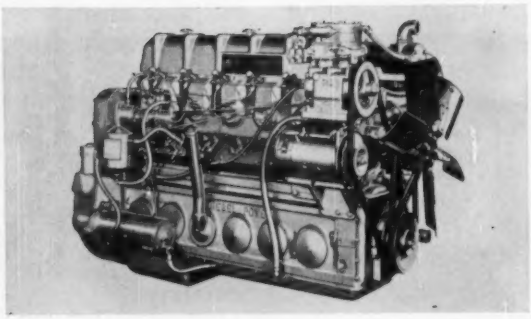
First step was to put the pyrometer on full-time duty. This was done by the Pyrotac. It was fitted with an adjustable high-limit switch that was set at the point where temperatures were considered excessive. If the temperature sensed by one of the thermocouples reached this limit, an alarm was sounded and/or the engine shut down, depending upon the arrangement.

Continuous scanning of individual cylinder temperatures was provided by a motorized switch having as many contacts as required. It had a pointer to show what cylinder was connected. If the high-limit switch was tripped, the switch stopped, showing the trouble spot.

This system gave immediate indication of any excessive temperatures and still provided actual cylinder temperature readings if these were to be recorded.

Incidently, this type of monitoring and alarm system can also be applied wherever continuous temperature checks are desired. This could include keeping tabs on crankshaft bearing temperatures or those of key spots in an engine-driven generator.

(*Continued on page 44*)



P & H broadens engine line

Harnischfeger increases its line of P & H automotive diesel engines with an "Economy" series

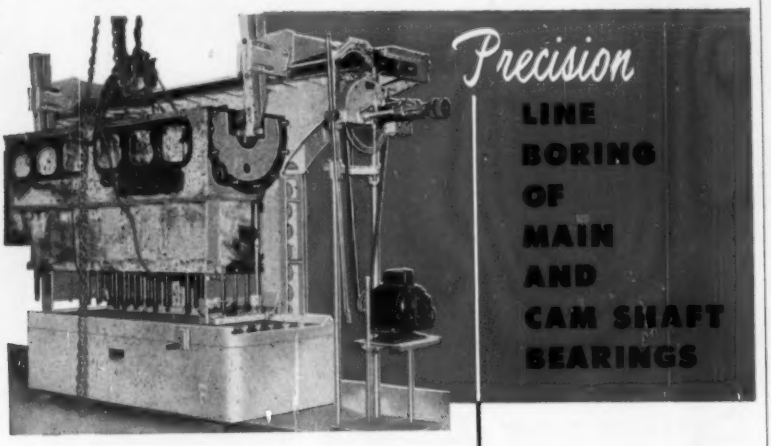
With the impact of the financing for Interstate Highway Construction still an unknown factor, attention of truckers is even more-than-usual directed toward cutting costs. In keeping with fleet horsepower requirements and the general profit picture, the Diesel Engine Division of Harnischfeger Corp. has added a new series of engines to its line.

Called the "Economy" series, engines are in 3, 4 and 6-cyl sizes, giving a power range from 135 to 330-hp. Engines are compact to fit into tighter engine compartments, and are quite light-weight. The 4-cyl 220-hp engine weighs 1480-lbs. This is accomplished in part by the extensive use of aluminum. The engines are, of course, two-cycle.

The majority of components making up the P&H line of engines, both the "economy" and standard engines, are interchangeable. Something like 80% of the parts. All engines have the same bore and stroke, with displacement (and power) varying as a function of the number of cylinders. Engines are available normally-aspirated or with turbo, with small power increments that help the purchaser match the power available exactly to the job that has to be done.

Economy in the "Economy" series is the result of changes in the injection system, timing, and blower speed have been altered from that of previous models. Overall result is improved fuel economy for the particular horsepower rating of the engine.

Also, while the design was simplified, serviceability has been made easier, too. The P&H "economy" series features the P&H unitized power assembly, and uses the Roosa Master fuel injection system.



with a **TOBIN-ARP** *Precision Engineered*
LINE BORING MACHINE

Precision centering with dial indicator to *positively* restore original center line of main and cam shaft bearing bores in warped or worn engines. Both models offer heavy duty capacity to bore Bearing Saddles in crank case castings for precision or plated bearings. Equipped with motor drive and hydraulic feed, a TAMCO Line Boring Machine will accomplish the largest or the smallest job (within range) with equal ease and accuracy.

MODEL TA-15 (shown above)
CAPACITY: Will handle engines with 96" overall spread of main or cam bearings. 20" side of crankcase to main bearing center line. 42" from table to bearing line. Wt. 1500 lbs. Shipping Wt. Domestic 1900.

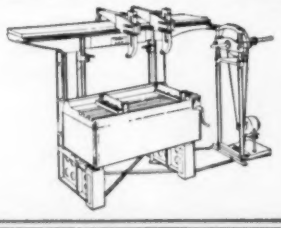
DIMENSIONS: Height 65", width 36", length 118". Add 3 ft. to length for minimum operating space.

TOBIN-ARP MFG. CO.
6400 PENN AVENUE SOUTH
MINNEAPOLIS 23, MINNESOTA

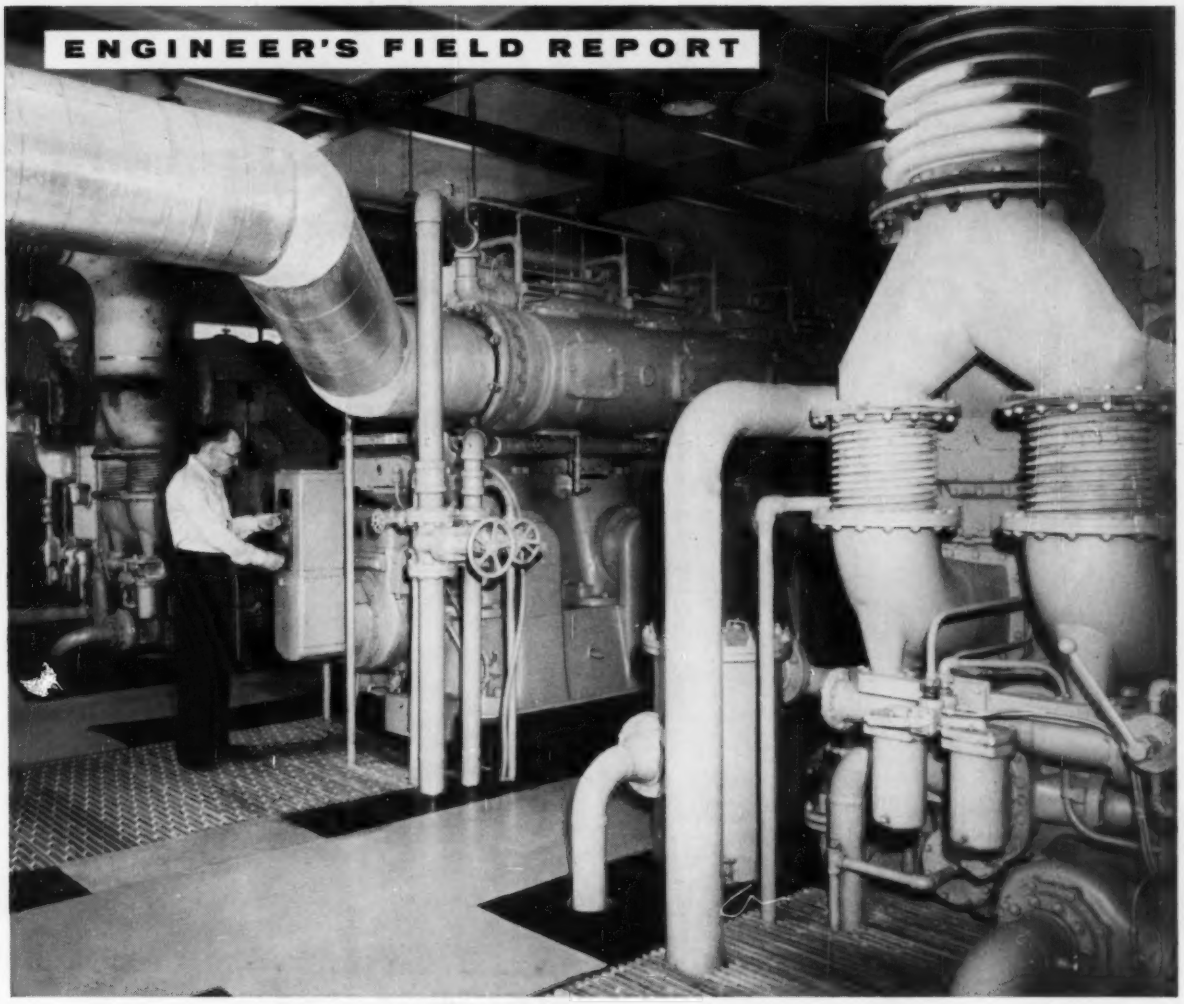
A TAMCO PRODUCT

MODEL TA-14
CAPACITY: Will handle engines with 72" overall spread of main or cam bearings. 16" side of crankcase to main bearing center line. 32" from table to bearing line. Weight 1200 lbs. Shipping weight Domestic 1500.

DIMENSIONS: Height 55", width 32", length 93". Add 3 ft. to length for minimum operating space.



For more information write in No. 17



Maintenance costs cut 60% using RPM DELO Oil

The Municipal Power Plant, West Bend, Iowa operates four diesel engines generating over 4 million hours of electric power a year. Since 1945, RPM DELO Oils have done an outstanding lubrication job . . . extended overhaul periods, and reduced maintenance costs by 60%.

Plant Superintendent N. P. Cuplin reports: "At the last major overhaul of our 1400 hp. Fairbanks Morse diesel, average wear on ten cylinder liners was only .007 after 4½ years of continuous operation. This is one third of normal wear. Interior parts were clean and unclogged.

"We tried a number of other products before we settled on RPM DELO Lubricating Oil. We've not only cut maintenance expense but have reduced fuel costs too, because RPM DELO's higher cleaning ability has allowed us to use a lower gravity diesel fuel oil."

RPM DELO OIL reduces wear and prolongs engine life because it clings to parts whether engine is running or idle. An anti-oxidant fights gum and lacquer formation, special detergent keeps parts clean. Other additives prevent bearing corrosion, crankcase foaming.

Why not try RPM DELO Oil? Let it cut your costs, lengthen equipment life. Just call your local representative or write any company listed below.

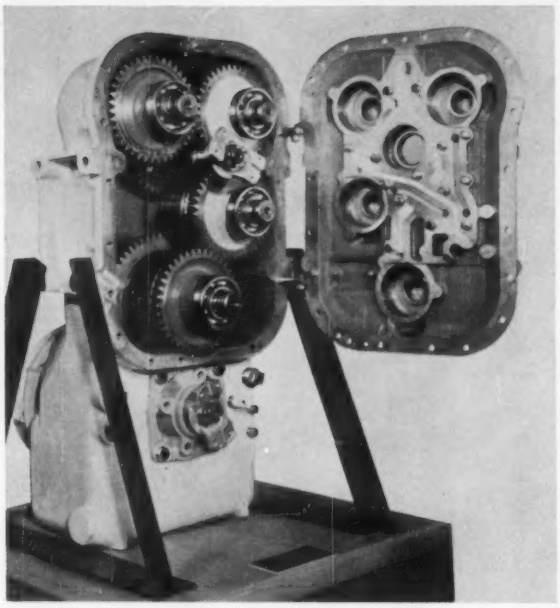
RPM DELO LUBRICATING OILS

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • **STANDARD OIL COMPANY OF TEXAS,** El Paso
CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey - Denver, Colorado

TRADEMARK "RPM DELO" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

For more information write in No. 18

Product Report:



Clark Equipment's Small-Engine Power Shift Transmission

Unit was designed with two speeds forward, two reverse for use with torque converter behind engines of approximately 100-hp

To meet demand for power train components to drive small engines that must stand up to continuous heavy duty operation, Clark Equipment Company has integrated design of a torque converter and a four-speed power shift transmission in a unique package. Engineers of the company's Automotive Division who developed the new package put a high priority on simplicity and indestructibility.

Designated the 2000 Series and designed for use behind Clark's C-270 torque converter, the new transmission employs a combination of hydraulic and mechanical shifting. Power shifting is made available where it is needed most. The package is recommended for use with approximately 100-hp engines.

Commercial applications for this transmission include front end loaders, lift trucks, and rollers. Potential additional applications include a wide range of off-highway vehicles, tractors, and construction equipment.

Integrated Hydraulic System

Torque converter oil serves both to lubricate the transmission and to provide the power medium for clutch actuation. The need for an additional separate hydraulic system is thus eliminated. Simplicity of design is reflected in both lower manufacturing and lower maintenance costs.

Oil flow is shown in Fig. 1. The transmission case serves as the sump, from which oil is drawn by a pump mounted on the converter but powered by the engine. The oil then flows through the filter to the converter. A pressure regulator valve mounted on the converter supplies pressurized oil for operation of the hydraulic clutches, for lubrication, and for charging the converter.

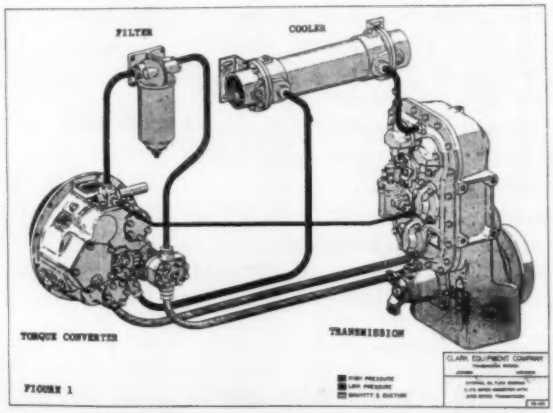
On leaving the converter, the oil is passed through a heat exchanger. The cooled oil is then admitted into the top of the transmission assembly, from which it is distributed to all surfaces requiring lubrication.

Four clutches permit the power shift selection of high and low gears and forward and reverse directions. A manual range shift is provided for shifting from low to high range. The high range gears are designed for use in traveling at higher speeds and with lighter loads. These ratios are, of course, fully power shifted.

Oil Channels in Cover Plate

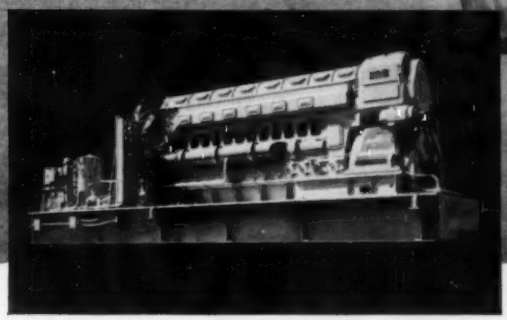
Another novel feature of the Clark design is the use of oil passages cast into the transmission cover plate (Fig. 3). Two separate sets of channels are provided.

(Continued on page 32)



Integrated hydraulic system eliminates need for separate systems. Converter oil also lubricates transmission, actuates clutches.

NOW! FULL POWER IS 15 SECONDS FAST!



Solve peak-load and standby problems! F-M's exclusive O-P Diesel Generating Units provide *full* power in 15 short seconds . . . *from a cold start!* They need no spinning reserve. Use no power till you use them! The reason? Our exclusive O-P (Opposed-Piston) design. Two pistons in one cylinder function from a *single* combustion. This minimizes *vibration* . . . produces fine *balance, smooth* power to peak the generator—in just 15 seconds! F-M Opposed-Piston Diesel Generating Units are available with automatic or manual controls. Produce up to 2500 kw per unit. They may be linked in multiple units for peaking, standby duty . . . or dead load pickup! You can't buy better—or more economically.

For full details or custom specifications, write today to: **Mr. S. K. Howard; Diesel Division; Fairbanks, Morse & Co.; Beloit, Wisconsin.**

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A MAJOR INDUSTRIAL COMPONENT OF

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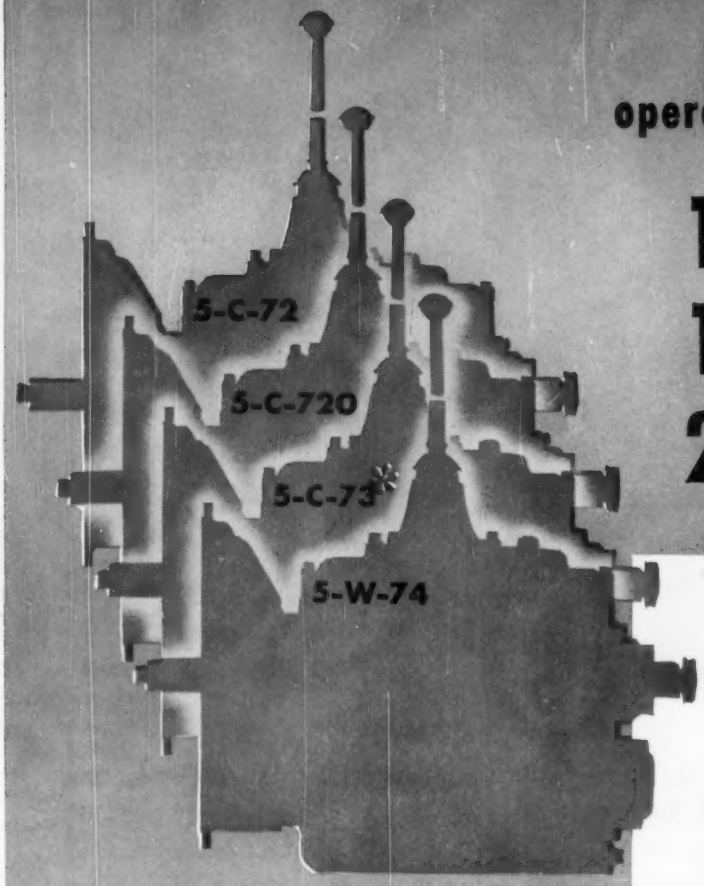
For more information write in No. 19

VERSATILE, DEPENDABLE FULLER 5-Speeds



provide maximum operational flexibility

10 speeds with 2-speed axle or 2-speed auxiliary

15 speeds with 3-speed tandem axle or 3-speed auxiliary

20 speeds with 4-speed auxiliary

Lightweight options with aluminum housings:

- Model 5-CA-72
- Model 5-CA-720
- Model 5-CA-73*
- Model 5-WA-74

93 pounds lighter

* designed specifically for use with Eaton 3-speed tandem axles.

For maximum flexibility, dependability, and versatility, specify Fuller

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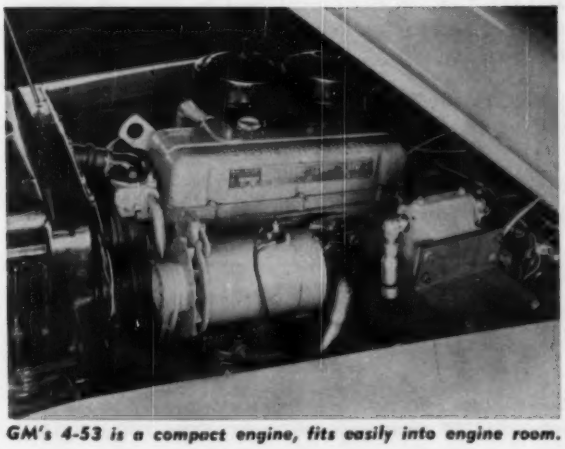
For more information write in No. 20

Studebaker-Packard's line of factory-fitted GM 4-53 diesel powered trucks are in 19,500 and 23,000 GVW class.

Studebaker-Packard Builds new Truck Line

Powered by GM Series 4-53 diesel engines, medium-duty vehicles cover broad applicational requirements with standard factory production.



GM's 4-53 is a compact engine, fits easily into engine room.

Studebaker-Packard Corporation has made a significant move toward bringing a share of the expanding market for medium-duty diesel-powered trucks to South Bend. S-P has initiated volume production on a new line of rugged cargo carriers, fitted at the factory with GM 4-53 diesels as standard equipment.

Volume production will add impetus to the trend toward dieselization within this medium-duty framework, which also includes light-load short-haul operation. This is an expanding market for diesel engines and S-P's decision was unquestionably influenced by the increasing number of re-powerings for this service. There are more Series 53's, for example, on the road as repowering units than there are as original installations. At idle, or at stop-and-go, economies of diesel over gasoline-power are very pronounced. Thus, the new truck line has marked user advantages even over S-P's own line of gasoline-powered trucks.

S-P's decision to enter this market is based on a market evaluation that foreshadows good things to come for the diesel industry. To quote L. E. Minkel, vice-president, marketing, at S-P, "These models represent a new concept of transport vehicle, as promising in the truck field as was the recent appearance of compacts in the passenger car market. Their introduction is the result of substantial market research which shows an immediate and growing demand for medium-duty diesel trucks."

S-P's Truck Line . . .

(Continued from preceding page)

The Truck Line

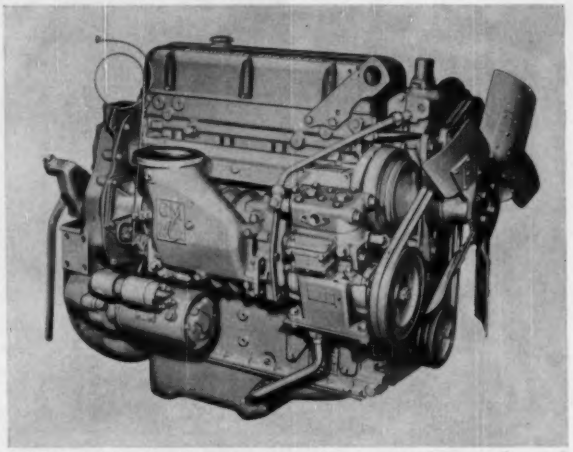
Line of trucks offered are 19,500 and 23,000 GVW and 35,000 and 41,000 GCW vehicles. The smaller series' axles are rated 5000 and 15,000 front and rear; the larger series' is rated 7000 and 16,000. Four wheelbases range from 131 to 191-ins.

A reinforced chassis is used for diesel application, which tailors chassis durability to engine longevity. Forward chassis section is strengthened by meaty crossmembers, insuring rigidity under any additional loadings that accompany the 4-53 installation.

GM's 4-53 is rated 130-hp @ 2800-rpm, with maximum torque of 271-lb/ft @ 1500-rpm. Bore and stroke are 3⅞ x 4½-ins; compression ratio is 17:1. Electrical system standard equipment is 30-amp generator and 140-amp/hr battery.

Still within the framework of the standard factory vehicle, diesel-engined trucks are offered with a range of options to match each unit to its specific application. Vacuum-assisted brakes are standard, with air brakes available, too. Standard transmission is direct four-speed, with options of direct five-speed or overdrive. All models are offered as chassis and cab or chassis and cowl.

S-P's production will be meaningful to accessory suppliers in the expanding aftermarket, while the parts and service network that is part of every sale will be one of the user benefits of the Studebaker-GM combination. Service availability is a factor that will be considered by prospective purchasers, as well as the low maintenance and low operating costs that will certainly accrue.



GM's 4-53 is a well proven-in-service engine. Frequently used in repowering, it offers compactness, economy and ruggedness.

Clark Transmission . . .

(Continued from page 28)

One carries lubrication oil from the inlet at the top of the plate to the clutch shafts. The other channels the hydraulic pressure to the proper clutch shafts.

The hydraulic clutches (See Fig. 2) are of conventional multiple disc type. Special features include provision for smoother engagement and quick, positive dumping upon release. Three of the four clutch assemblies are identical. The fourth uses many of the same components. All clutches and gears may be removed and reinstalled by removal of the cover plate without dropping the transmission. Simplified servicing and minimum replacement inventory needs reflect these design features.

Ease of maintenance is also built into the unit. The transmission is simply installed using four horizontal bolts on each side.

Versatile Torque Converter

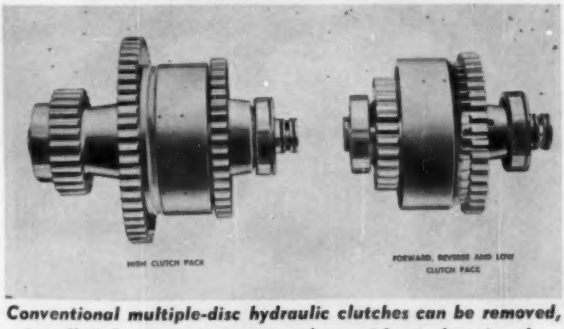
The torque converter also is designed for versatility. It can be rotated in increments of 30 degrees (SAE No. 3 bell housing is standard) to permit selection of the best output shaft or accessory location. Torque multiplying ratio of 3-to-1 is standard on the torque converter, although special blade wheels are available.

Three engine-driven pump drives are provided on the converter. One is required for the combination lube oil and hydraulic circuit pump. The other drives may be employed to power such accessories as air compressors or bucket and steering hydraulic pumps using separate circuits.

Centerline of the transmission output is 17 inches below the input shaft. An additional 4½ inch centerline displacement, either up or down or to either side, is available by use of the optional offset drive on the torque converter. The transmission is available in the two-wheel or four-wheel-drive versions. Other options include disconnect for front or rear drive, parking brake, and a brake inter-lock clutch release.

Summary

Clark's Power Shift transmission, designed for smaller engines, helps extend the range of smaller off-highway and construction equipment, add to their ultilization, and by increasing productivity reduce the total cost of operation.



Conventional multiple-disc hydraulic clutches can be removed, reinstalled by removing cover plate without dropping box.

Reduce maintenance...increase equipment life

with

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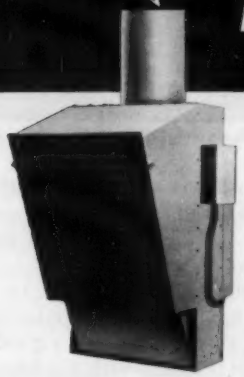
There's one to meet every need!



AIR-MAZE AUTOMAZE—the automatic, self-cleaning impingement type filter for heavy-duty use. A constantly moving curtain of viscous-coated double filter panels traps air-borne particles. Panels are thoroughly cleaned and recoated by passing through an adhesive bath. Filters consist of layers of crimped galvanized steel wire screens of selected meshes. Available in all capacities with or without weather louvres or plenums. Air or electric drive optional.

AIR-MAZE "DA" DRY-TYPE FILTER—laboratory tested for better than 98% efficiency with particles of 2 micron mean diameter, practically 100% with particles 5 microns or larger. Corrosion resistant, designed for use up to 6650 cfm. Filter media is heavy, deep-pleated wool felt flanked by sturdy galvanized steel cloth. Element can be cleaned with a commercial solvent or by blowing off with compressed air.

AIR-MAZE OIL BATH FILTER—the low-pressure-loss way to oil wash intake air. Offers a distinct engineering advancement because it provides low static pressure drop without requiring any outside energy. Removes practically all fine abrasives and dirt! No moving parts, nothing to wear out, easier servicing! Made of rugged, heavy gauge steel coated with enamel. Available in capacities up to 20,000 cfm.

Write for latest bulletins on AIR-MAZE complete line of air and liquid filters and intake silencers for all types of large engines and compressors.

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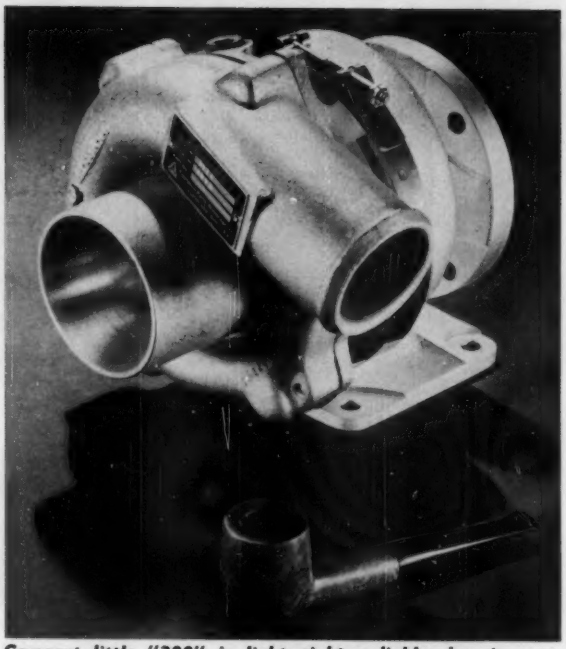
CLEVELAND 28, OHIO
ROCKWELL-STANDARD CORPORATION

For more information write in No. 21

Product Report:

TRW adds Model 300 turbocharger

Light, compact and simple, the new Model 300 is the smallest of three turbocharger models designed and produced by Thompson Ramo Wooldridge's Turbocharger Department.



Compact little "300" is lightweight, reliable, low in cost.

"High-speed diesel engines are just getting into what you might call the 'second generation' of turbocharging. This is due to: (1) Improvements in the state of the art; (2) a better understanding of turbocharged performance on the part of users and, perhaps above all, (3) a growing trend to design engines with turbochargers considered as much an integral engine part as the connecting rods."

This statement and comments to follow were made by W. L. Dennis, sales manager of Thompson Ramo Wooldridge's Turbocharger Department. They were preliminary to a technical discussion of their latest product, the compact Model 300 turbocharger. He continued . . .

"Many new engines on the boards follow this pattern of integrated design. They are built with specific applications in mind and to specific horsepower requirements—turbocharged! Because of improved performance and low size and weight in relation to horsepower, I foresee broadening use of such diesels, particularly in the area of the lighter trucks and commercial vehicles.

"I'm talking of engines in sizes that today produce from 50 to 120-hp, naturally-aspirated. Turbocharged, horsepowers will probably be increased by 60% to 70% or more, making a very attractive package.

"However, small-displacement engines create problems for the turbocharger designer both in performance and costs. Adequate air flows must be provided at up to the 3:1 ratio that seems desired today and response must be practically immediate. This must be done with a small, light and simple unit with a service life matching that of other major engine components.

"Then there's cost. Here we have a parallel in fuel injection equipment. As engine sizes go down, cost of injection equipment becomes a disproportionately higher percentage of total engine cost. It's been true with turbochargers too. But just as there has been significant reduction in injection equipment cost, since inception of the turbo for high-speed diesels there have been cost reductions of 50% or more. With our new "300" we're going further along this line.

"Delivery of these, the particular execution being designated Model 317, has started for application on a new engine soon to be announced. Also, a good many are out for evaluation and testing. With the Model 300 and Model 400, we're set for the spectrum of both today's and tomorrow's high-speed engines in the range from 50 to 4000 hp."

It's plain to see that Wally Dennis is sold not only on TRW's line of turbochargers but on the future of turbocharging in general. His enthusiasm is catching. The compact little "300" certainly looks like an answer to turbocharging the new crop of lower-horsepower engines and we're told that the price is right.

Chief engineer Hugh MacInnes covered technical details of the new turbo. First, it's small (see photo) and light (about 15 lb), both important for its projected applications. Second, it's simple and has a minimum number parts, all of which are readily interchangeable. All the parts are seen in the exploded view. Like all TRW turbochargers it uses a vee-band clamp to hold the whole rotating assembly including compressor to the turbine scroll case.

The turbine scroll case is cast of high-grade exhaust manifold iron. Built to mount directly on the exhaust manifold, it has a single entry. No nozzle ring is used. Matching the turbine to specific engine requirements is done by selection of the proper housing. A set of housings, each with a slightly modified gas flow area, provides the necessary flexibility for close matching.

A center housing of aluminum supports the rotating assembly in a single one-piece aluminum bearing. The bearing, seen to the left of the turbine wheel and shaft,

floats in the housing bore. Its flanged design provides thrust faces as well as the inner and outer radial bearing surfaces. Being relatively short, it permits a short shaft and shortens up the whole turbocharger.

At the hot end of this housing there's a spring-backed heat shield (center row). When mounted in the end of the housing, the shield can expand axially against its spring backing as temperatures change.

A very efficient oil seal (small disc, bottom) seals oil leakage into the compressor. Metallic piston-ring type sealing elements are used. The compressor end of the housing is closed by the large disc, bottom row.

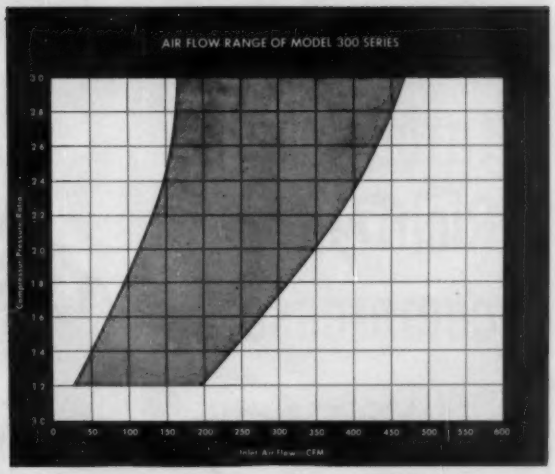
The compressor scroll case bolts with a gasketted joint to the center housing. It is of the vaneless diffuser type.

The compressor wheel is of a high-strength aluminum alloy. Inertia of the assembly is low, providing fast response to changes in exhaust gas energy.

Rotating components are separately balanced to very close tolerances at the factory. Mr. MacInnes states that this will permit complete interchangeability in the field without need for balancing. For example, if an accident should occur to the turbine wheel, a new turbine and shaft assembly could be used with the original compressor wheel without need for balancing. This is an attractive feature from a maintenance viewpoint.

Use of the vee-band clamp also has maintenance value. Single-bolt release permits the whole unit, less the turbine housing, to be removed for bench-inspection, cleaning and any necessary repairs. From an installational viewpoint it also allows complete flexibility (through 360 deg) in positioning the compressor outlet.

Lubricating oil is supplied by engine. Since it is under pressure, location of the inlet is not critical. However, oil drains back by gravity. Three drain outlets, 120 deg apart, are provided, and after the compressor is positioned, the one at the bottom, nearest vertical, can be connected.



Summary

TRW sees a tremendous potential for turbocharging in general and they are convinced, with their current line, that they can get their share of this potential. Wally Dennis pointed out, "We, along with the other turbocharger manufacturers, have vastly improved products. Add to this the fact that engine designers are working more closely with us to produce better, fully-integrated packages.

"Any users who might have a bad after-taste in their mouths as the result of experience with early turbochargers should take a fresh look. Today's turbochargers are a new breed, a second generation. They're more efficient, simpler and more compact, and will stand up with the rest of the engine. They'll give you more horsepower per pound of engine, they'll maintain power up to higher altitudes and normally will produce better specific fuel consumption.

"And they're doing this at a lower cost than ever before and we haven't seen the end yet. Wait until turbocharging reaches its full potential!"

All components of model 300 turbocharger. Top, l. to r.: compressor housing, center housing, V-band clamp, turbine housing. Center: heat shield, spring backing plate. Bottom, left to right: compressor wheel, housing closure, oil seal, retaining ring, shaft bearing, turbine shaft and wheel attached.

Multiple-turbocharged Richfield compressors prove economy of operation and maintenance

Turbocharging has increased output by 9000 hp on 42 existing compressor installations of the Richfield Oil Corporation, such as this one near Bakersfield, California.

Power output of Richfield Oil Corporation's 2 cycle natural gas compressors has been economically increased 30-40 per cent by the AiResearch multiple turbocharger system . . . utilizing existing compressors, personnel and plant size.

At the same time, during the three years in which turbocharged units have been in operation, unscheduled down time and maintenance have been at a minimum.

In addition to long service life, the turbochargers in the AiResearch multiple system are smaller, easier to handle and less expensive to maintain or replace than a large turbocharger of a single unit system.

These rugged turbochargers have also accumulated many years of proven trouble-free operation in a wide variety of the most demanding vehicular applications. Extremely simple in design and requiring no separate cooling system, they are another example of AiResearch leadership in the development and production of air-cooled turbochargers and turbocharger controls for all major engine applications.

Your inquiries are invited.

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

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Name your engine

Chances are Koppers Piston Rings were installed by the original equipment manufacturer. More leading manufacturers select Koppers Piston Rings for their predictable performance and dependability. Koppers wide range of types and sizes . . . variety of materials . . . control of materials . . . close tolerance manufacture . . . rigid standards of inspection . . . *all* contribute to Koppers leadership in the field.

If you have a problem in ring application, avoid further needless expense and delay. Let us know the type of service (diesel, natural gas engine, dual fuel, compressors, etc.), along with the make and model of the equipment. Our engineers will send you the recommended set-up promptly. Write to: KOPPERS COMPANY, INC., Piston Ring and Seal Department, 6406 Scott Street, Baltimore 3, Maryland.

Koppers Porous Chromium-Plated Compression Rings are used extensively in many types of engines and compressors. Intensive tests have demonstrated that chromium-plated rings in the first or first and second grooves reduce cylinder wear one-quarter to one-third of that experienced with unplated rings. Where operating conditions or dimensional tolerances require a ring that will adapt itself readily to the cylinder, porous chrome-plated compression rings are the most popular type. For special conditions, Koppers also makes available dense, threaded or grooved face chromium-plated rings.

The **Koppers Tapered Ring** has a taper on its outside face of either 1° or 2°, depending on the size of the ring. It is used in gasoline, aircraft, gas and diesel engines, and in compressors because it seats-in more rapidly than other standard compression rings. This advantage makes it especially applicable to hardened or chromium-plated cylinders. In out-of-round or distorted cylinders, its ability to seat-in quickly helps prevent blow-by. It may be used in as many compression ring grooves on a piston as necessary; but, ordinarily, when a quick-seating ring is required for the top groove, a Grooved Back Ring or other special ring is used.

The **Koppers Seal Ring** has one band of bearing bronze rolled into a groove on its face. This band projects approximately .004" beyond the face of the cast iron ring. The ring seats quickly because high unit pressure is exerted on the narrow bronze band, preventing blow-by in new or worn cylinders. As the bronze wears, it burnishes the cylinder wall to a mirror-like surface and allows the cast iron body of the ring to reach a seat very gradually. Throughout the life of the ring, the bi-metallic surface serves more effectively to eliminate scuffing, improve lubrication, and reduce wear on cylinder, rings and piston. This ring may be designed to employ two bronze bands if specified.

The **Koppers Grooved Oilcutter Ring** has a continuous channel around its outside face and a series of slots extending through the ring from the base of the channel; and the upper edges of the bearing surfaces are beveled to ride over the oil film on the upstroke. The lower sides of its scraping edges are undercut to form in each a small oil-collecting groove. The oil caught by the upper scraping edge drains through the slots in the ring. The oil caught by the lower scraping edge drains down the cylinder and through holes drilled through the piston from a drainage groove beneath the oil ring groove. The unit pressure of the ring keeps more nearly uniform; consequently, the efficiency of the ring is more constant.

The outer element of the **Koppers Conformable Grooved Oilcutter Ring** is made of cast iron sufficiently thin in cross section to permit maximum flexibility. The inner element is a coiled steel expander spring, the ends of which are butted together. Closed to cylinder size, the spring exerts uniform radial pressure against the ring, forcing it to conform to the cylinder wall although that surface may be neither round nor true. The spring has a low spring rate in order to prevent any appreciable change in pressure as the ring wears. The Conformable Oil Ring maintains a high unit pressure, uniformly distributed, throughout the life of the ring, providing better oil control. For certain four cycle engines, Koppers provides a notched Conformable Grooved Oilcutter Ring to provide more positive oil drainage.

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COMPANY PROFILE:

MILLION 4 Injection Pumps for HMS

How RoosaMaster Division of Hartford Machine Screw Company reached this milestone . . . . some contemporary history.

IF YOU'VE LOST FAITH in today's opportunities for individual initiative, this story should be a reaffirmation. It's a story of a man, his ideas and what came out of the combination. The man is Vernon Roosa; his ideas centered on a new-type fuel injection pump; the combination resulted in the RoosaMaster Fuel Injection Division, Hartford Machine Screw Company.

This month, Hartford Machine Screw Company will complete its quarter-millionth fuel injection pump. Significance of this figure increases when you consider that HMS is a comparative newcomer with no previous experience in the fuel injection equipment field . . . in fact, in any parallel or related field! Furthermore, this total volume has been attained since the date of their first production order in March of 1952!

People and Perseverance

During the depression of the '30's, a man did what he could find to do. One of the few good things that can be said for this period is that in moving around, a man got broad experience. It brought Vernon Roosa into contact with diesels and their then-current problems. It also brought Vern into contact with Ernest Willson in a relationship that's still going strong.

Perhaps it's their differences that pulled them together. Vernon spurts ideas like a cracked high-pressure fuel line spurts fuel. With this creativeness, he has tremendous enthusiasm. When he's got his teeth into something he goes all the way. Yet he's not the dreamy-eyed inventor . . . on the contrary, he's very practical with a positive gift for simplification.

Ernest "Red" Willson is different. Red is cautious, wants to be shown . . . and you're not going to sell him any gold bricks. He takes the practical viewpoint and is very painstaking when he tackles something. It's clear

"I've got to find out for myself. I was told that inlet metering was no good but I tried it and proved it worked. In fact, it has a lot of advantages."—

Vernon Roosa, Director of Research

Temperature-controlled room where high-pressure fitting is done.

"Everything started with an idea; it sparked enthusiasm and created team spirit. But it's taken a lot of hard work by many good people to get where we are today."—

Jim Ford, General Manager

"You can't jump to conclusions. You often think you know why something happens . . . but look out! I've found that the obvious answers are not necessarily the right ones."—

Ernest Willson, Engineering Manager

that he and Vernon go together like "love" and "marriage". This simile was chosen because it leaves room for the inevitable disagreements that once resolved, makes the bonds stronger.

Evolution and Experience

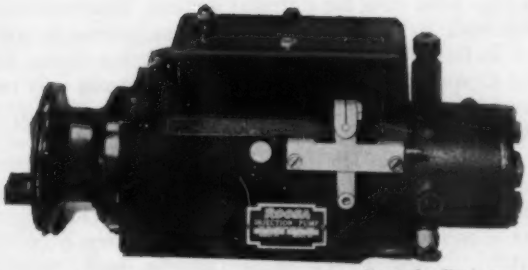
Early in their experience, Vernon and Red could easily have come to the conclusion that the sole function of the diesel engine was to cause trouble. They rarely saw one that was running properly . . . until they'd worked it over and were ready to leave for the next ailing engine.

They worked for such companies as Automatic Diesel Electric Company, International Diesel Electric Company and Petroleum, Heat, Light & Power Company, all in the New York area. It was a good training ground. Vern reached one conclusion: Too many troubles were caused by injection pumps and governors; something better was needed. Wheels started turning, his eyes flashed and he conceived an idea for a new type of pump.

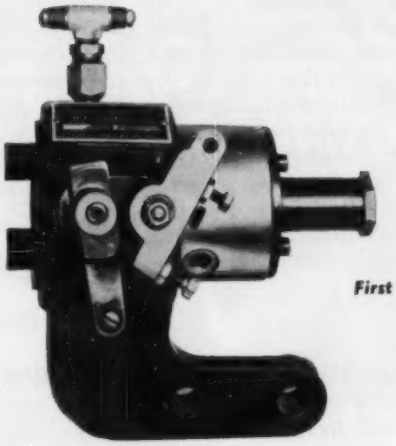
It was to be a distributor-type pump featuring inlet metering and simple, positive governing. While there were many mechanical variations made in the pump's history, these features have been retained. Metering on the low-pressure side was not viewed with favor by engineers in the business, in fact, some said it could not give good regulation. Vernon went ahead anyhow because as he has stated many times, "I have to see for myself."

It was in 1940 that the first pump was built on an old lathe in Roosa's basement. It wasn't just built for kicks; it was built for a specific application. Trouble was being experienced on a diesel-generator set providing electrical power in a building at One Christopher Street, New York City. The pump with its integral governor was installed on the 2000-rpm engine where it piled up 14,000 operating hours. Operation was essentially trouble-free and regulation was maintained within 1 to 2%!

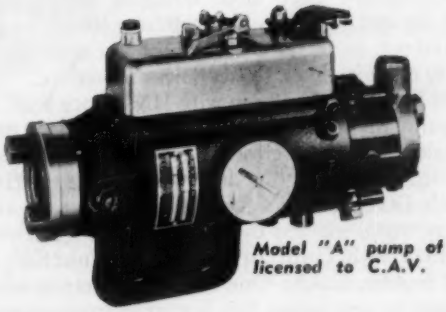
Vernon and Red kept working on the pump design as a 2-man development team. They refined and simplified, tested, tried. One interesting thing they did was to convert the engine in a Pontiac to diesel operation.



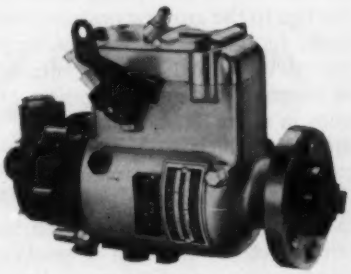
Roosa's first pump.



First HMS-built pump.



Model "A" pump of type licensed to C.A.V.



Present Model DB

We're told that it ran fine! Then, to coin a phrase, "Came the war!" Red went into the Navy and Vern went into defense work for International Diesel Electric Company.

Vernon now had more than an idea; he had a pump that worked. In the course of his work with IDECO, 24

pumps were built for different engines. Representation was made to the government and they became interested. In fact, by 1945, Roosa had a contract with the Signal Corps to supply them pumps. There was only one trouble; at IDECO he lacked the production capacity to meet the volume demand.

Here's where Hartford Machine Screw Company came into the picture for the first time. They were specialists in production of precision screw machine parts, could and would make the pumps. There was only one catch . . . before the pumps could be made, the war ended and the contract was canceled.

Development never stopped . . . nor did efforts to interest fuel injection equipment builders and those in similar lines. It was Hartford Machine Screw Company that came through. At that time the 70-yr old company was planning diversification. Although established as a maker of screw machine parts for the automotive, textile and aircraft industries, they had no proprietary product. By getting one they felt that they could make better use of their facilities and would have a cushion against the fierce competition in the screw machine business. Getting Vernon's pump looked like an ideal opportunity.

Hartford History

Vernon started at HMS in May, 1947, and Red Willson joined up three months later. By July of the same year, HMS had built its first pump. Their problems had just started. Having their own product required a change in orientation. They faced intensive engineering and need for test facilities. Production methods had to be worked out. In the face of established competition they had to organize for effective sales and service.

Jim Ford, who had been with HMS since 1946, joined the pump division and went to work in 1952 to organize the sales and service effort. Then in the same year they got their first production order—pumps for the Hercules models DOO and DJX for Oliver crawler tractors.

May, 1953, marked the licensing arrangement made by HMS with Great Britain's largest injection equipment builder, C.A.V. One of the most outstanding advantages in concluding this licensing arrangements was the significant recognition of Vern's pump and its principles. It added prestige to the growing organization and provided opportunity for cross-fertilization of ideas in further research and development. It also offered access to C.A.V.'s widespread service organization to take care of HMS pumps in many foreign lands.

C.A.V. gained an important objective. While concentrating on a high rate of "in-line" pump production at their Rochester, England, plant, they were in search of a small, simple pump that could be mass-produced to sell at lower cost. Their target was the crop of smaller diesels that were finding growing application in light vehicles and tractors.

Their success in precision engineering production and the acceptance of their product is proven by the fact that since introduction of their "DPA" pump in 1956 (it took time to complete engineering and testing and install the new production tooling) they have produced a half-million units! It is also a commentary on the size of the British diesel engine industry that this many pumps could be absorbed. Current production of the DPA is at the rate of about 250,000 pumps per year . . . and C.A.V. is still expanding its facilities.

. . . and Today

Vernon Roosa's "idea" of the 1940's has had a profound influence on the diesel industry. The pump's simplicity, flexibility and small size, coupled with low cost, have set a tough competitive pace. And competition exists . . . it's healthy that it does. It produces better products at lower prices. There are more, better and lower-cost high-speed diesels in consequence and so both the diesel industry—and the user—have benefitted.

Getting back to the RoosaMaster pump, it is now used on the following engine makes: Allis Chalmers; J. I. Case; Continental Motors; John Deere; Ford Motor Co., Tractor & Implement Div.; Harnishfeger; Hercules; International Harvester; Minneapolis-Moline; Schramm; Waukesha; and Witte. Approval has been granted by the Army's Signal Corps and Corps of Engineers, by the Navy and the Air Force.

This widespread usage and acceptance speaks well for the product. But product development is only one part of the whole story. After the product is built it must be sold and supported by service and parts in the field.

General Manager Jim Ford has seen to it that progress has been made on all fronts. As to sales effectiveness, Jim reports a continually climbing curve since the first production order—with the last quarter being the best in the company's history!

Parts and service are now available to users on an international basis. HMS has leaned heavily on Association of Diesel Specialist members to implement this. Jim Britton, Service Manager, has done an excellent job keeping service standards high through a continual flow of technical information and an extensive service training program.

Vernon Roosa as Director of Research and Red Willson, Engineering Manager, see that there is continuing product improvement—improvements in performance and life; greater mounting and drive flexibility; provision for automatic timing advance; application of different governor types to meet a broad requirement range. And it isn't over yet, Vernon says that he still has a lot of new things up his sleeve!

Last stop for pumps before shipment is final calibration, testing and run-in.

1 HIGH-SPEED OPERATION
Balanced release levers permit high-speed drives. Lever "throwout" is eliminated for longer bearing life. Patented anti-friction rollers give instant release with minimum pedal pressure.

2 ACCURATE FIT
Close-tolerance drive between cover and pressure plate assures smooth starts. Highly accurate bolt circle fits flat flywheels—accurate outside pilot diameter fits counterbored flywheels.

3 VIBRATION DAMPENER
Coil-spring vibration dampener absorbs vibrations between engine and transmission. Noise, rattle and thrash in the gear train are eliminated for smooth, quiet clutch operation.

ROCKFORD SPRING-LOADED CLUTCH

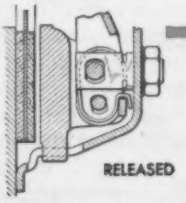
International model C-130 Dump Truck equipped with Rockford Spring-Loaded Clutch

4 HIGH-TORQUE DESIGN
Powerful engagement springs, properly spaced over the facing area, assure maximum driving contact. Compact, low-inertia design prevents gear clashing and delayed shifting.

5 SMOOTH ENGAGEMENTS
Dynamic and static balancing assures you of smooth, enduring clutch performance. Both driving and driven members are balanced to eliminate vibration.

6 HIGH-TEST FACINGS
Using only the highest quality facings, Rockford Clutches give extra-long clutch life, provide cushioned starts, reduce scoring and greatly cut costs of downtime replacement and labor.

7 PERFECT ALIGNMENT
Close-tolerance splined hub assures perfect disc alignment. Through-hardened hub gives long life. Precision manufacturing and rigid quality control eliminate chances for misalignment.



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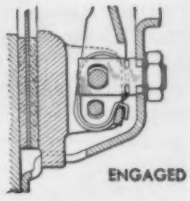

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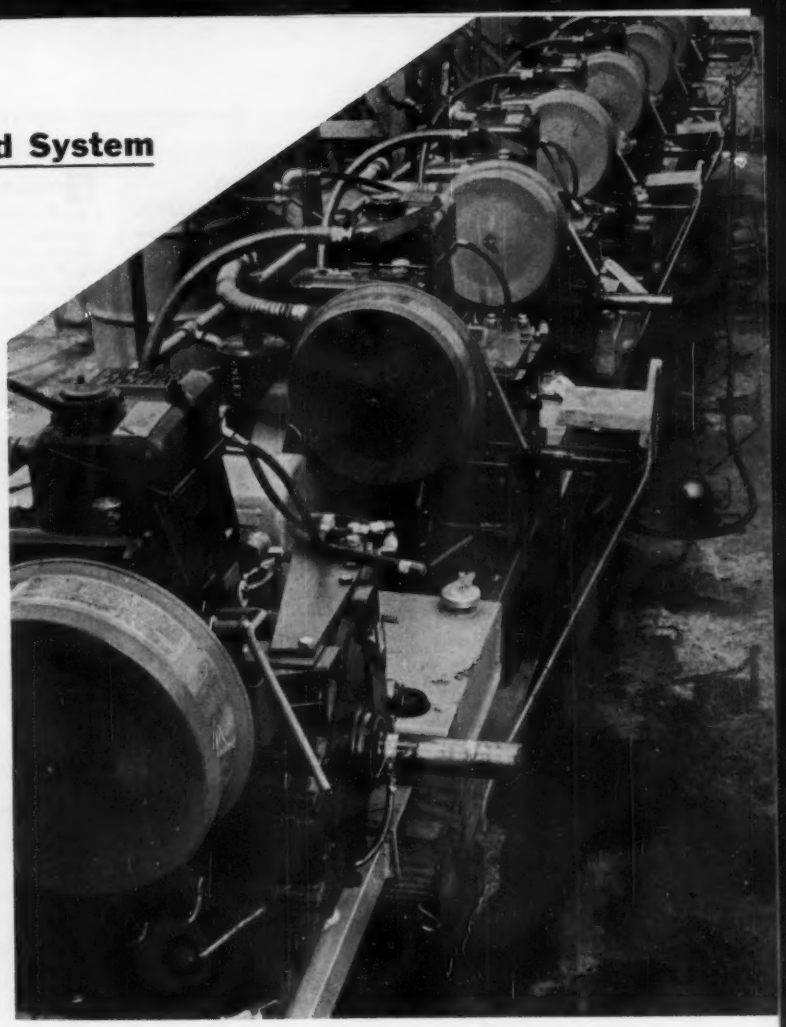
New Life for an Old System

Preco's "Cargotemp" Cools Produce



Small diesel engine powers forced-air cooling in ice bunker cars at low initial costs —at low operating cost

Pacific Fruit Express Company calls it "Ice-Tempco". Preco, the manufacturer of the unit, calls it "Cargotemp". Produce growers and shippers call it a slick way to save millions of dollars in refrigerated railroad transit costs.

The Preco designed and manufactured unit inspiring this confusion in semantics is a diesel-powered forced-air system that has rejuvenated the ice bunker refrigerated railroad car by increasing both its produce hauling capacity and its refrigeration efficiency. It means that a large number of the 80,000-odd ice bunker cars once thought headed for obsolescence, as fast as mechanically refrigerated cars could be constructed, are now enjoying a second lease on life. They are now starting to recapture much of the produce business they had begun to lose.

Preco's Cargotemp system still uses ice as the produce coolant but has improved its cooling efficiency with a small diesel engine that provides a rugged, continuously-operating forced-air system. With forced-air, it is possible to obtain faster and more precisely controlled cooling. In some instances, the forced-air system has actually used less ice than non-forced air-cooling, even though cooling efficiency is increased.

These increased efficiencies are achieved by drawing the cold air out of the ice bunker at one end of the car and circulating it through the load of produce. Electric fans and dampers are used to control cold air circulation. Power for the blowers is supplied by a five-horsepower air-cooled diesel engine-powered electric alternator set.

The Cargotemp system does not compete with mechanical refrigeration where temperatures below 35° are required. But where temperatures in the 35° to 70° range can be accepted—and this covers the bulk of fresh produce—the Preco Cargotemp system fills the bill at an operating cost of less than 80¢ per day, not including ice. Usually, this is much less than the cost of mechanical refrigeration.

Unit Operation

While shipper-use may differ between the modified ice bunker car and the mechanically refrigerated car, the operational demands of the mechanical equipment are identical. Equipment is subjected to constant vibration and occasional severe shocks. Yet, it is expected to operate under full-load full-speed for days on end with no attention.

Initial cost and subsequent maintenance considerations dictated a diesel electric set virtually stripped of all control devices and as foolproof in operation as possible. The result was selection of either of two air-cooled handcranked diesels—the Petter model PC—1 (rated at 5-hp @ 3,000-rpm) and the Lister-Blackstone

single-cylinder diesel (rated at 4.7-hp @ 2,000-rpm.) In the case of either engine, the Preco alternator is connected by a belt drive.

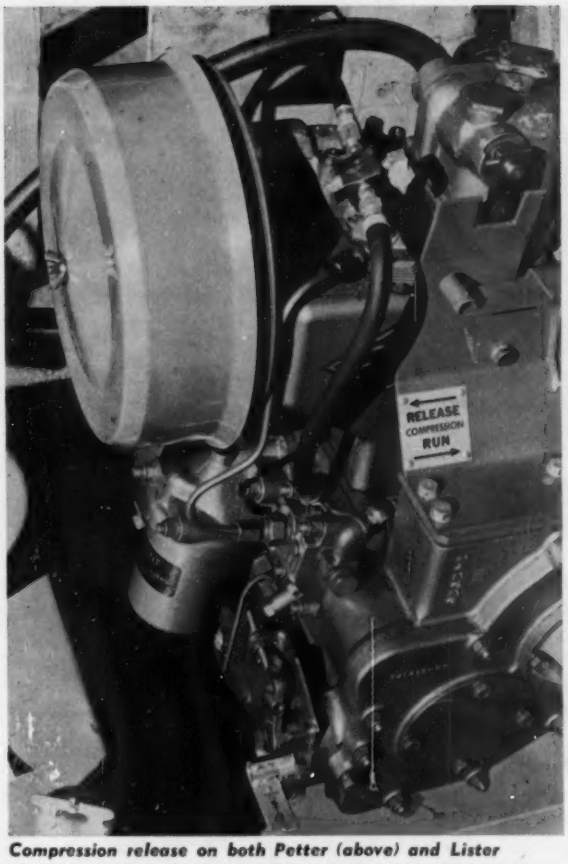
Along with an auxiliary lube oil tank, muffler and spark arrester and the electric junction box for the alternator, the engine-alternator assembly is installed in an engine compartment suspended beneath the car. Adjacent is a 60-gal fuel tank that provides fuel for 15 to 20 days of continuous operation.

Preco has no illusions over the kind of usage these little diesels receive. Preco has been designing and building railroad produce-car cooling and heating systems for several decades. They designed the engine installation to withstand an acceleration of 15-g's longitudinally, 5 g's vertically and 3 g's laterally! The assembled unit is distinguished by its singular lack of control mechanisms, because of equipment dependability.

Before loading produce, the diesel is hand-cranked for starting. A modification of the compression release lever on each of the diesels makes this a simple task. Release units were relocated to the front of the engine for accessibility while cranking.

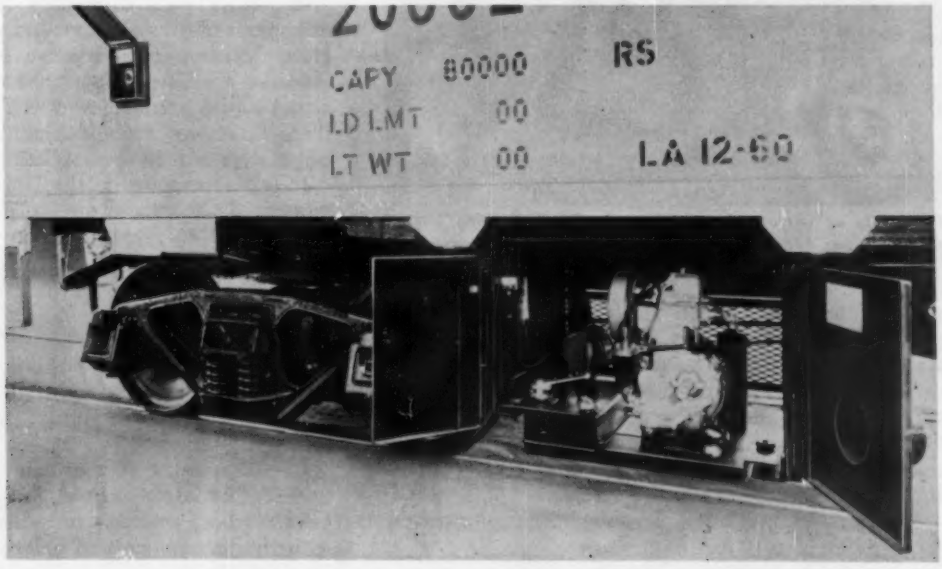
Equipment is designed to run constantly at fixed rpm, with alternator connected to the diesel drive shaft by a double belt. In the case of the Petter, which runs at 2200 rpm, the pulley ratio is 1:1. The Lister, with an operating speed of 1800 rpm, steps up speed to the alternator through difference in pulley size. Both engines are expected to run for 15 to 20 days unattended. There are no fail-safe switches, no manual throttling mechanism, no indicating lights or dials. The 3½ pint lube-oil sump is supplemented by a 4-gal. auxiliary tank.

Possibility of entrapped air in the fuel system causing engine shutdown has been eliminated by tying a line between the bleeder plug on the fuel filter to the by-pass at the injectors. The Petter has an exposed pump and the tie-in work was easily accomplished with



Compression release on both Petter (above) and Lister (opposite page) were relocated to front of the engines where they could be reached easily for starting, stopping.

Single-cylinder diesel power unit for the fans is located under the car, providing more car volume for payload. Control box (upper left) controls temp from outside car.



Preco's "Cargotemp" . . .

(Continued from preceding page)

flexible fuel hose. With the enclosed pump (on the Lister) a copper bleed pipe and "Y" fitting was fabricated to run from the bleed side of the injector past the rockers and out the lower portion of the fuel pump housing door to the filter.

Engine-alternator supplies power for four fans, mounted between the single ice bunker and the cargo section of the car, circulating cold air until a pre-set thermostat's reading is reached. Then, switches automatically shut down three of the four fans and close the dampers between the ice and cargo areas. The fourth fan continues to circulate air through the lading area and a special bunker by-pass duct where the thermostat is located.

User Advantages

A few significant figures tell the economic importance of this system. Today's mechanical refrigerated car costs around $30,000; the installed Cargotemp costs approximately $1500. Cargotemp, by making efficient use of ice, permits removal of the bunker at one end of the car, increasing effective lading area. In many cases, efficient circulation in Cargotemp-equipped cars permits higher packing of produce, which has the effect of increasing car capacity.

All this means big savings to shippers whose produce does not require very low temperatures. They can get more produce into a car, and the Preco method of refrigeration is inexpensive. Combined economies can run as high as $163 per car on lettuce and $269 per car on cantaloupes, according to Preco. At the same time, the vastly increased efficiency made possible by Cargotemp permits produce temperature to be drawn down quicker in the modified ice bunker car than in the mechanical reefer.

In the right application, Preco's diesel-engine-driven cooling system is a real money-saver.

Possibility of entrapped air in the fuel line causing engine shutdown has been eliminated by installation of bleeder line.

Alnor's Pyrotac . . .

(Continued from page 25)

Now, Monitoring Temperature Differentials

Latest of Alnor's system refinements is their Load Balance Monitoring System. This recognizes the fact that the principal use of a pyrometer is to indicate *differences* from normal temperatures, either on the plus or minus side.

A cylinder's exhaust temperature is proportional to the load it carries. Therefore, at any given percentage of engine load, the pyrometer will give a reading that is "normal" for that load condition. When cylinders are balanced and each carries its share of total load on the engine at the time, cylinder temperature readings will fall within close limits. Assuming no general overload, it is not the *actual temperatures* that are important; it's the *difference* among them.

This was the basis for development of what Alnor calls their "Temperature Differential Double-Target Pyrotoller." This instrument shows the difference of each cylinder temperature reading from the computed average of all the other cylinders. It is connected to the thermocouples in turn by a special motorized switch with modified circuitry. When there is no difference or only very minor ones, the needle hovers at the center "o" mark. The scale reads up to 300°F each side of the center mark to show the amount of any difference and whether it is on the high or low side.

Any desired high and low limits can be set from the front of the instrument. If a cylinder temperature differs from the average in either direction by more than the pre-set value, the appropriate limit switch is actuated. Time for each cylinder reading, including computation of averages, is about five seconds. And it's all done automatically and continuously.

Pyrometry Now Fits System Concept

This current array of instruments makes them suitable for inclusion in today's "system" concept. One example is illustrated. Here, individual cylinder temperature deviation from average is monitored for both banks of a vee-type engine. Manual switching to take actual cylinder temperatures is also provided. For both these functions, a double-element thermocouple in a single stem is used to sense temperatures.

Inlet temperatures to the two turbochargers are also monitored. Pyrotac's are used and the high-limit switches set to give indication of excessive temperatures that could damage the turbochargers. These could also be considered as devices for warning of engine overload.

Signals from the Pyrotoller and Pyrotac's can be used to trigger alarms and/or shutdowns as desired. Also, signals can be used for functions within the plant, can be transmitted by wire or even microwave to a remote control center, or both.

In conclusion, pyrometers are still basic instrumentation for the larger engines. Refinements and developments of both products and techniques have kept pace with the requirements of today's engine applications.

POWER IDEAS from COTTA

Pumping | Locomotives | Construction | Drilling

How to reduce six costs of operating heavy equipment

Totally balanced power transmission fits maximum torque to your type of work.

Heavy equipment users have been known to count engine horsepower closely on a machine . . . then ignore the number of dollars they pay out to keep it working.

Others, quick to measure daily operating costs such as:

1. equipment
2. fuel
3. replacement parts
4. service calls
5. wages
6. overhead

. . . end up with dollars and new contracts in their pockets by selecting transmissions which minimize loss between applied and delivered power; absorb the severe shock loads common to big machine operations.

Add to these the intangible savings in space, weight, engine life, and unnecessary "hardware," and you can begin to judge how *totally balanced power transmission* economizes big-machine operations.

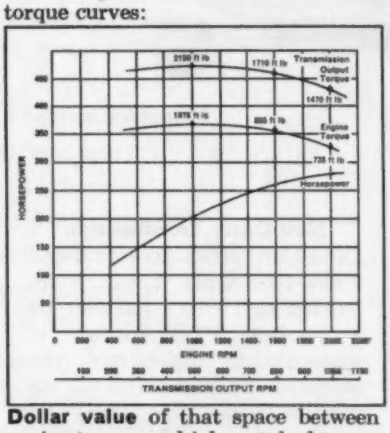
Engine manufacturers advise that an engine of proper horsepower for a job doesn't necessarily have the correct speed characteristics essential for peak operating efficiency on that job. They are among the first to tell you that shrewd selection of power transmission equipment will increase engine performance by permitting it to operate at or near governed speed.

More and more frequently in these days of heavy equipment specialization, a standard transmission matched to individual jobs is the recommendation.

Contractors, loggers, miners, drillers — heavy-equipment users in all fields

— are learning how quickly a Cotta gearbox which matches engine speeds to common loads can pay for itself out of savings.

For example, proper gear reduction can give a diesel delivering 280 hp at 2000 rpm this much difference in torque curves:



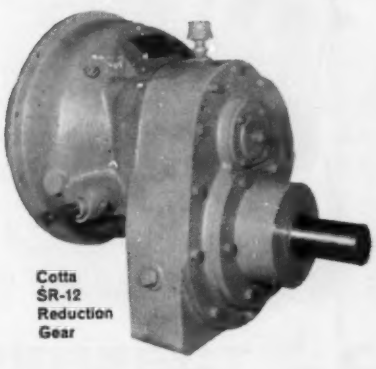
Dollar value of that space between engine torque and job-matched transmission torque curves goes as high as:

1. Maximum engine power at your best fuel-consumption rate.
2. Fewer and lower costs for parts, service, and downtime.
3. Increased productivity, because maximum engine torque develops at speeds most common for your particular application.

Time to save these dollars is during the design stage of your equipment. Our engineers will be glad to discuss whether a job-matched transmission can help you . . . where it can help you . . . how much it can save by decreasing your total operating costs. We will custom-design *even a single unit* to fit your engine applications from 100 to 750 hp.

Standard drives, too — single-speed reduction or over-speed gear transmissions — are ready for prompt delivery. Input torque capacities range from 150 to 2500 ft-lb.

Write for free diagrams, capacity tables, dimensions, and complete specifications. Our phone number is 815 WO 4-5671.



Cotta SR-12 Reduction Gear

COTTA

HEAVY-DUTY TRANSMISSIONS

COTTA TRANSMISSION CO., ROCKFORD, ILLINOIS

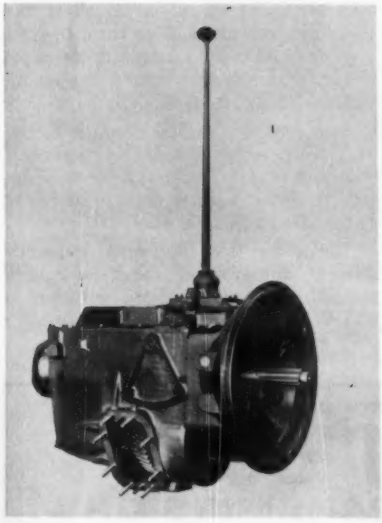
For more information write in No. 25

diesel power

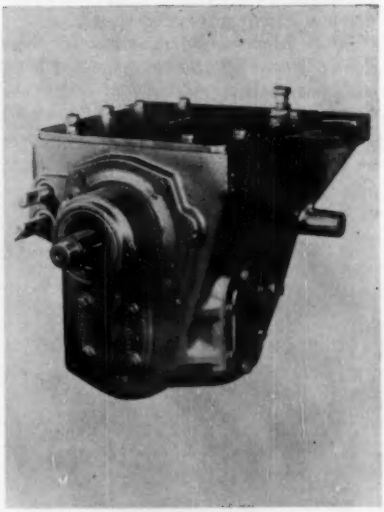
new products

International Series 400 Has Tilt Hood
Forward-tilting hood and fender assembly is a design highlight of the new International 400 Series conventional trucks. One-man one-hand operation tilts fibreglass assembly open.

Low-Cost Nozzle Tester
A simple low-cost injector tester to check nozzle pressure settings has been introduced by Leslie Hartridge, Ltd, manufacturer of diesel test and service equipment. Named Nozzle Poptest, tester uses hand-operated hydraulic system with self-priming pump that delivers fuel instantly at any operating-lever setting. Poptest comes complete with connectors for "S" and "R" injectors of standard thread and cone size. 22-lb weight makes Poptest valuable in small shops or to fleet operators, since it can be installed in a truck easily and taken out in the field with no difficulty.



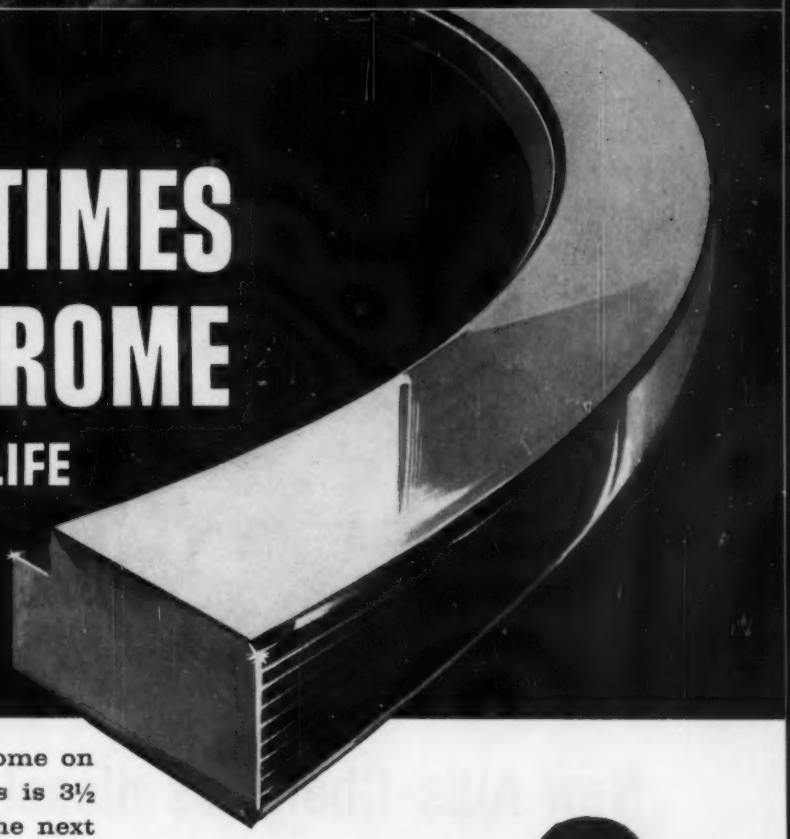
New Case, Transmission
Dana Corporation has introduced a new 6000 Series "Spicer" transmission case (left) featuring an 8 bolt-hole PTO aperture to accommodate high-torque side-mounted PTO installations on vehicles in the 50,000-lb GVW range. Also, (right), a new 4-speed auxiliary transmission with normal torque rating of 550- to 600-lb/ft is offered. Model 7041 auxiliary weighs 340-lbs, has constant-mesh helical gears throughout. Spicer claims the 7041 is smaller than any unit of similar capacity.



PERFECT CIRCLE PISTON RINGS ARE INSTALLED AS ORIGINAL FACTORY EQUIPMENT IN 94 BRANDS OF VEHICLES AND ENGINES

3½ TIMES THICKER CHROME

LENGTHENS ENGINE LIFE



Comparison tests show that the chrome on Perfect Circle replacement ring sets is 3½ times thicker than the average of the next four most popular brands—and almost twice as thick as the nearest competitive brand.*

Perfect Circle pioneered solid chrome—proved repeatedly to be harder and longer wearing than any other piston ring surface.

This superior chrome surface enables engines to deliver peak performance far longer—keeps power high and oil consumption low for thousands of extra miles.

Extra-thick, solid chrome is just one reason why so many leading engine and vehicle manufacturers, fleet operators, race drivers and mechanics prefer and specify PC rings.

For finest quality that means longer life, always install genuine Perfect Circles—the rings the "pros" prefer.

*Based on measurement of top rings from replacement sets for the two most popular V-8 engines

THE DOCTOR OF MOTORS
Skilled mechanics the world over prefer and install Perfect Circle piston rings

PERFECT CIRCLE

PISTON RINGS • POWER SERVICE PRODUCTS
HAGERSTOWN, INDIANA • DON MILLS, ONTARIO, CANADA

For more information write in No. 26

New Allis-Chalmers diesel delivers 340 hp... handles 30-yard loads with ease and economy

Cast nickel-alloyed engine parts resist heat and pounding wear... help cut operating costs

Mud, hardpan or loose fill... this husky Allis-Chalmers TS-360 Motor Scraper shaves off a 30-yard load in seconds, then hustles it away at 25 mph.

For this snappy performance, give a whole lot of credit to A-C's new 21000 Series, 340 hp turbocharged diesel up there under the hood. Here is an engine built with nickel-alloyed castings that help it squeeze more useable power from every drop of fuel... help it deliver constant high-torque output 'round the clock.

For the turbocharger casing, A-C engineers specify Ni-Resist* nickel-alloyed austenitic iron. Ni-Resist casings defy internal temperatures up to 1400°F — withstand hot corrosive exhaust gases that tend to warp and crack ordinary iron parts. Ni-Resist casings assure long, trouble-free service in the most rugged operating conditions.

Top ring groove piston inserts are also made of Ni-Resist iron. They stand up to the merciless pounding and friction inside the cylinders—prevent power-wasting blow-by and costly oil consumption.

For the engine block, nickel cast iron is A-C's choice. Nickel cast iron promotes dimensional stability throughout the complex rib-walled block design — promotes the strength, toughness and pressure tightness so vital in a high compression engine.

When you build, buy or operate heavy-duty diesel equipment, specify turbocharged diesel engines with nickel-alloyed parts. You'll be specifying power and economy. And to find out how these nickel-alloyed engine parts can help shave your diesel-operating costs, just drop a note to Inco, c/o Foundry Industry Manager.

*Registered Inco trademark

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- ☐ Mining & Quarrying
- Other (explain) _____
- ☐ Municipal Power Plant
- ☐ Utility Power Plant
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- ☐ Engine or Equipment Manufacturer
- ☐ Engine or Equipment Distributor
- ☐ Engine or Equipment Service and Repair

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- ☐ Railroad Transportation
- ☐ Lumber & Logging
- ☐ Mining & Quarrying
- Other (explain) _____
- ☐ Municipal Power Plant
- ☐ Utility Power Plant
- ☐ Consulting Engineering
- ☐ Engine or Equipment Manufacturer
- ☐ Engine or Equipment Distributor
- ☐ Engine or Equipment Service and Repair

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NEW PRODUCTS . . .

Safety Switch

Built into a bolt, a snap-acting high-temperature safety switch is announced by Therm-O-Stats, inc. Designed primarily for use on air-cooled engines, the switch could also be very useful in monitoring assembly temperatures.

53

Blow Hot or Cold . . . USG Test Gauge Is Accurate

United States Gauge Division, American Machine & Metals, has developed temperature compensated pressure gauges that maintain a high degree of accuracy over wide temperature spans.

They're available in four pressure ranges. Note their adaptability for portable test instruments as test gauges for shop equipment and as standards for calibration of other gauges in the shop.

54

New Moline M-5 Tractor . . .

A new series of tractors in the 60 to 70 hp class, the M-5 is designed for today's trend toward larger farm units. With full 5-plow, the diesel engine develops 69 brake hp, 59 belt hp and 54 drawbar hp.

55

Priority Valve

Isolation of any portion of hydraulic or pneumatic systems below a pre-set value is available in a line of priority valves from Circle Seal Products. Features include operating pressures to 2000-psi, fail-safe valve closure, leakproof isolation, smooth operating valve.

56

Rust Buster

Armite Laboratories Rust Buster is a penetrant packaged in a plastic squeeze bottle. Valuable feature is the extending flexible spout that allows the liquid to be placed exactly where needed.

57

Special Truck Cab Air Conditioner

Kysor Heater Co. has introduced two differently mounted models of an air conditioner for trucks, allowing condenser to be placed either in or out of the air stream. Rated capacity exceeds 1½-ton in both units. Both models are simple to install, covered by 1-yr guarantee.

58

Engine Test Stand

Owantonna Tool has introduced an engine test stand that can handle engines weighing up to 1200-lb. Different engines are set in the stand by means of an engine adapter bracket supplied with the stand. A self-locking worm-and-gear set makes turning easy, with 360° rotation.

59

Non-Destructive Testing for Cracks

Spotcheck by Magnaflux is available in spray-on cans to bring hidden cracks to the attention of inspector. Penetrant is sprayed on, then developed, showing crack as a red line in a white field. Easy to use, reliable.

60

FULTON SYLPHON SAFETY CONTROL—MODEL 530 BRAND NEW . . . $55.00!

Government Surplus, BRAND NEW, in factory packages. List Price $125.00. Provides positive protection against high water jacket temperature and low lubricating oil pressure. Adjustable temperature cut-off range 180-210 degrees; max. oil pressure 75 lbs.; adjustable cut-off range 2-25 PSI. Automatically shuts off engine fuel oil supply and drains fuel line between shut-off valve and injection pump. Supplied with 6' long tubing to temperature bulb. 11" h., 6" w., 2¾" deep. Shpg. wt. 12 lbs. FOB Chicago.

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(Quantity price 3 for $150.00)

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The more your service organization knows about Cummins the more productive and efficient it becomes in servicing all types of diesel engines. Interstate's Cummins-approved home study courses were prepared to improve productivity, skills and attitudes of your mechanics. The courses lower time cost of breaking in new men . . . help you operate a more efficient and profit-producing shop. Courses make Cummins factory training more meaningful. They are available to your experienced as well as beginning personnel.

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For more information write in No. 28

Remote Lube

Stewart-Warner's Alemite "Meter-Pak" centralized lubrication system is available for compressors, engines, and other heavy industrial equipment. Especially useful in protecting multiple bearing points on either attended or unattended equipment. Valves are individually adjustable to deliver from .003 to .015-cu in. per cycle; accuracy plus-or-minus 5% regardless of oil type or temperature; pressures from 100- to 7000-psi; a full line of powered pumps is available. 61

Affording Maintenance At Less Cost
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- Cylinder Heads
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Pioneers in research and manufacture of high speed diesel injection equipment.
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HUGE INVENTORY OF WAUKESHA ENGINE PARTS
ORDERS SHIPPED SAME DAY AS RECEIVED
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For more information write in No. 32

Torque Wrench With a Memory

P. A. Sturtevant Co. has developed a torque wrench that serves as a measuring instrument for making mechanical checks of stress, thrust, tension and compression. A tell-tale needle registers peak torque reached, and holds until reset. In tests, Sturtevant discovered that the tell-tale device improved accuracy or shortened test time in 2/3 of the specialized cases tested. 62

Waterproof Coupling

Lovejoy Flexible Coupling Co. has developed a line of flexible couplings designed to operate under water, 24-hrs a day, for a minimum of 3-yrs, without maintenance. They will also operate in oil, mild chemicals and corrosives. Couplings contain no intricate mechanisms, can be installed easily. Horsepower range is from 2.6- to 1365-hp @ 100-rpm, bore sizes from solid to 9½-ins. 63

Quick Starting

Recent tests conducted by Wilco Co. indicate that a single cold start is equivalent to 10- to 12-hrs running time. And, of course, tremendous battery (or air) drain. Wilco has developed Sure-Fire Starting Fluid, which is sprayed from a spray can into air intake and, according to Wilco, starts any engine in four seconds. Temperature range is as low as -65°. 64

Measures Peak Cylinder Pressures

A mechanical indicator designed to accurately measure peak compression and combustion pressures in high-speed diesel engines has been introduced by Kistler Instrument Corp. Ratings are displayed on a micrometer-like scale graduated from 0- to 2000-psi, in increments of two. Pocket-size gauge is completely self-contained; reading holds until reset. 65

No-Adapter Tube-to-Hose Fitting

A new fitting in the Lenz line of medium and high-pressure industrial hose fittings permits joining of tube directly to one end of a hose assembly without using an adapter. Tube end uses "O"-ring seal. Fittings are available single or double wire braid, ranging in ID from 3/16 to 1½-ins. 66

Zinc Anode Plug

A line of zinc anode plug assemblies has been specifically designed for water protection in all types of heat exchangers. Manufacturer is Butler Engineering Associates. Different threads are available on plugs from ½-in. to 1-in., can hold up to 200-psi. Weep holes, if desired. 67

Spiral Wrap Hose

Designed especially to meet the need for large-diameter high-pressure hose lines, Aeroquip has developed a spiral wrap hose for hydraulic systems. Hose sizes are from 1¼- to 2-in.; working pressures up to 3000-psi. Fittings are blowproof, detachable and reusable. Assembly requires simple hand tools. 68

Running Time Meter

Conforming to military specs as applicable, a 120-v 400-cycle running time meter has been announced by John W. Hobbs Corp. of Stewart-Warner. Designed for use with ground support military equipment, it finds wide commercial application for a variety of installations. 69

Body Repair Kit

Marson Corp. is marketing two kits that will make metal repairing quicker and easier. Each kit contains a rivet pliers and a supply of rivets. Kits differ in rivet diameter. With rivets, one man working alone can do a great many panel beating jobs, saving time and money. Kit is called "Pop" Rivet kit, is sold on money back guarantee. 70

En Bloc Pipeline Compressor Cylinder

A pipeline compressor designed by Clark Bros. features an improved accoustical system that eliminates separate external headers and their pulsation problems. En Bloc design has headers cast into the cylinder body. Suction and discharge headers open to the sides of the cylinders and are directly connected to the lead-in lead-out lines. 71

diesel power

new literature

Use your dp Reader Service Card.

"No-Skive" Parker Fittings Illustrated

The latest edition of Hoze-lok Catalog 4430, detailing the expansion of the Hoze-lok line is available. The addition of flange head ends and bent tube fittings with 37° swivel nuts has been announced by Parker Fittings & Hose Division of Parker Hannifin Corp.

This 12-page booklet features photographs and diagrams of the line, complete with specifications, assembly instructions and applications.

Two simple steps are all that are needed to assemble Hoze-lok-30. Steel fittings are re-usable, no skiving, sure to grip. Hose types are also described as well as flange head ends and bent tube fittings.

72

Military Products Described in Onan Booklet

D. W. Onan & Sons has published a 24-page color booklet providing information concerning Onan experience, products and facilities.

A history of the concern is included with details of all Onan military production. Typical military applications for diesel generator sets are illustrated with a list of current customers and applications. New Onan products, both standard or modified and developed for military service are described and illustrated.

Facilities pictured include the "World's largest Electric Plant Test Room". The plastic-bound brochure details the new "INSTA-PAC", a transistorized inverter power unit designed for instant emergency power in microwave and similar critical installations.

73

Viking's Positive Displacement Rotary Pumps

Living up to the Viking motto . . . "Showing the way" the company has published two new profusely illustrated booklets describing the Viking Rotary Pumps. "Positive Displacement Principle . . . and how it works" contains 36 two-color pages of pictures, charts and diagrams designed to graphically present the characteristics of their pumps. Complete specifications and applications are given.

"Multi-Ring Heavy Duty Pumps" has 24 pages covering Viking Heavy-Duty Diesel pumps. There's a complete Engineering Section with recommended speeds and capacities for various liquids and actual performance graphs.

74

Washington Iron Works Offers "Years of Experience" in Diesels

Completely equipped shops designed to service every kind of diesel repair are maintained by Washington Iron Works, Sherman, Texas. Skilled personnel, superior equipment, combine to care for any and every kind of diesel job. Service even includes duplicating parts not obtainable from the manufacturer. The jobs are done in the shop . . . or in the field.

The company's new, two-color folder illustrates the scope of its services. With the motto: "Keeping pace with Diesel Progress," this firm "delivers" and has been for over 70 years. Your inquiries are invited regardless of the size or kind of mechanical emergency!

75

Three Timely Cat Releases

Caterpillar Tractor Co. has published three new brochures—and they're now available for the asking. "Controlled Water Works for You" discusses the benefits that can be derived through national attention to water control.

More about water problems is taken up in "Water Bill U.S.A.", a 16-page booklet covering national water problems and some of the ways America's farming practices and watershed control programs are coping with them.

Illustrating how a progressive manufacturer keeps abreast of the times, maintaining leadership in the field, Cat's new eight-page pamphlet "Looking Ahead" tells how the company is striving to make today's machines better while it works on the machines of tomorrow.

76

Utility Tractor Specs

Features and specs of Allis-Chalmers crawler and wheel utility tractor equipment are available in an illustrated spec sheet. Each model is pictured, complete with attachments engineered to it.

77

Automotive Multi-Fuel Engines

U. S. Dept. of Commerce paper 61-11100 "Uses of Multifuels in Automobile engines" is available in translation from Russian. Outlines problems of development, utilization, and benefits; talks about various kinds of engines using these fuels. Also covers experiments in converting monofuel engines to multifuel use.

78

Chrome Plating

An attractive 8-page 2-color folder published by Industrial Hard Chrome Plating Corp. explains how hard chrome plating and the Kanigen process are being used in all kinds of industry. Emphasis is on reclaiming parts destined for scrap.

79

New Symbol

Volvo Truck Div. has prepared a brochure describing the size of the company (which, incidentally, would be about 250th, if Americas top 500 industrial manufacturers were listed), and about their product. Specific details are given on their truck line, for varied application.

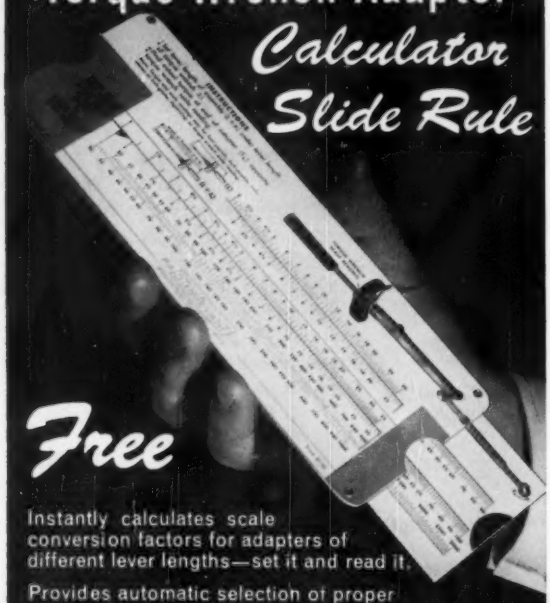
80

Engine Control

"News Currents", organ of Electric Regulator Corp., will send reprints of their January '61 issue, which treats of the Regohm transducer. There is also a separate bulletin available on the transducer unit. "News Currents" stories show how they control throttle on a long bus without mechanical linkage, and how they control power output of a turbocharged engine as ambient conditions change. They're letting you peer over the shoulders of the engineers.

81

Torque Wrench Adapter
Calculator
Slide Rule



Free

Instantly calculates scale conversion factors for adapters of different lever lengths—set it and read it.

Provides automatic selection of proper torque wrench for adapters and/or proper adapters to go with given torque wrenches.

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P.A. STURTEVANT CO.
ADDISON QUALITY ILLINOIS

For more information write in No. 33

NEW HARTRIDGE POWERMASTER "8" CAN HANDLE 99% OF YOUR DIESEL FUEL PUMP TEST REQUIREMENTS

If you're looking for one *all-purpose* test bench, the Powermaster "8" is it! Designed to fill the gap between the Hartridge medium-sized and heavy-duty models, Powermaster "8" is powered by a 5 h.p. motor to handle all types of Diesel fuel pumps up to 8-cylinder capacity.

Powermaster "8" incorporates all advanced features of other Hartridge test benches, including electronic and pressure phasing which saves 40 minutes service time against ordinary spill timing. In addition, it will record automatically up to 1,000 strokes without manual re-setting.

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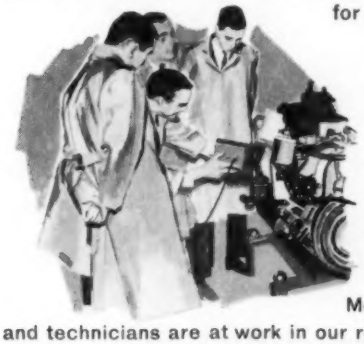

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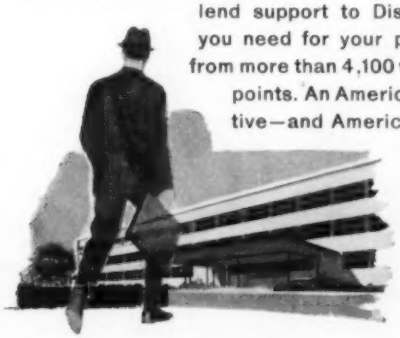

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